United States Naval Academy

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Annapolis, Maryland

Profile

The school: Founded as the Naval School in 1845, the United States Naval Academy today is a four-year service academy that prepares midshipmen morally, mentally and physically to be professional officers in the naval service.

Location: The academy is set on 338 acres between the south bank of the Severn River and historic downtown Annapolis, the state capital of Maryland. Annapolis is 33 miles east of Washington, D.C., and 30 miles southeast of Baltimore.

Campus: The Yard, as the campus is called, features tree-lined brick walks, French Renaissance and contemporary architecture and scenic vistas of the Chesapeake Bay. The Bancroft Hall dormitory complex, The Cathedral of the Navy, and other 80-year-old buildings make the academy a National Historic Site. New facilities such as the multi-purpose Alumni Hall, Nimitz Library with more than half a million volumes, Rickover Hall engineering complex and Hendrix Oceanography Laboratory give the academy ultra-modern educational resources.

Students: About 4,300 men and women represent every state in the U.S. and several foreign countries.

Faculty: The 650-member Naval Academy faculty is an integrated group of military and civilian instructors in approximately equal numbers. The student-faculty ratio is low, with most class sizes ranging from 10 to 22 students.

Academics: In addition to a core curriculum of academic and professional courses, majors are offered in 18 subject areas: eight in engineering; six in science, mathematics and computer science; and four in the humanities and social sciences.

Professional training: Subjects such as small arms, drill, seamanship and navigation, tactics, naval engineering, naval weapons, leadership and military law are learned during the four-year program. In addition, midshipmen train at naval bases and on ships of the fleet during part of each summer.

Athletics: Midshipmen can choose from 23 men's and 10 women's intercollegiate varsity sports, 30 intramural sports and 12 club sports.

Extracurricular activities: More than 100 extracurricular activities are offered in areas ranging from music and drama to parachuting and scuba diving.

Graduation: Bachelor of science degrees specifying a major field are awarded to midshipmen upon graduation in May. They are commissioned as ensigns in the U.S. Navy or second lieutenants in the U.S. Marine Corps and serve at least six years of exciting and rewarding service as naval officers.

For more information, call the Candidate Guidance Office: **410-267-4361**

or write:

Candidate Guidance Office
117 Decatur Road
United States Naval Academy
Annapolis, Md. 21402-5018

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United States Naval Academy

Catalog 1992-1993

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Annapolis, Maryland

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Introduction

United States Naval Academy

As the undergraduate college of the Navy, the Naval Academy prepares young men and women to become professional officers in the U.S. Navy and Marine Corps. Naval Academy students are midshipmen on active duty in the U.S. Navy. They attend the academy for four years, graduating with bachelor of science degrees and commissions as ensigns in the Navy or second lieutenants in the Marine Corps. Naval Academy graduates serve at least six years as naval officers.

Around the Yard

The scenic Naval Academy campus, known as the Yard, is located in historic Annapolis, Md., where the Severn River flows into the Chesapeake Bay. With its combination of early 20th-century and modern buildings, the Naval Academy is a blend of tradition and state-of-the-art technology that typifies today's Navy and Marine Corps. Throughout the Yard, tree-shaded monuments commemorate the bravery and heroism that are an important part of the academy's heritage. Buildings and walkways are named for Naval Academy graduates who have contributed to naval history and their nation.

Rear Admiral Thomas C. Lynch graduated with academic and leadership distinction from the Naval Academy in 1964. As a career surface warfare officer, he served in various ships and commanded the frigate USS Truett for three years. Admiral Lynch also served as assistant director, Candidate Guidance Office; was the administrative assistant and naval aide to the Secretary of the Navy; earned a master's degree from George Washington University; and directed the Navy's Office of Legislative Affairs. He commanded Cruiser-Destroyer Group Twelve home ported in Mayport, Fla., and, while embarked aboard the aircraft carrier USS Dwight D. Eisenhower, lead the battle group which was first on scene in the Red Sea prepared to provide naval firepower after the August 1990 invasion of Kuwait by Iraq. Admiral Lynch became the 54th superintendent of the United States Naval Academy on June 15, 1991.

The young men and women who make the choice for excellence -- those who decide to come to the United States Naval Academy -- are the best and brightest this nation has to offer. We take great pride in our leadership and education programs that prepare our students to be commissioned officers in the U.S. Navy and Marine Corps. It is this singularity of purpose and focus on excellence that sets us apart from other colleges and universities. Our goal, quite simply, is to develop leaders for the world's greatest Navy and Marine Corps.

At the United States Naval Academy, you become part of an extremely proud tradition of excellence that spans more than five generations. Since 1845, we have provided the finest educational facilities, most up-to-date and modern labs and equipment, and outstanding athletic programs. These programs and facilities, combined with the nonpareil qualifications and tireless dedication of our faculty and staff who help guide and develop our midshipmen, are unmatched anywhere. This is our fundamental and all encompassing commitment to excellence. There is one important aspect about the Naval Academy that we guarantee: We offer you the challenge of a lifetime and the opportunity to perform to your full potential.

This nation entrusts to us its greatest national treasure, the best of its youth. That is each of you... the future of this nation. And, as world events continue to prove, you are the brand of young man and woman needed at the United States Naval Academy today, to prepare for leadership roles in the Navy and Marine Corps of tomorrow. I challenge you to come onboard, accept this call and share in our excellence.

The Naval Academy also is the final resting place of Revolutionary War naval hero John Paul Jones whose words, "I have not yet begun to fight," have inspired generations of U.S. naval officers. His crypt is located beneath the academy chapel, also known as the Cathedral of the Navy. A National Historic Site, the Naval Academy hosts about one million tourists every year from all over the United States and the world. They come to enjoy the natural beauty of the Yard, to recall some of this country's naval history and to marvel at the traditions carried on in midshipmen parades and military formations.

Tourists and midshipmen also appreciate that downtown Annapolis lies right outside the gates of the academy. With its colonial charm and busy waterfront, Maryland's state capital provides a pleasant, diverse setting for one of America's premier colleges, the United States Naval Academy.

History

The academy started as the Naval School in 1845, founded by Secretary of the Navy George Bancroft on 10 acres of old Fort Severn in Annapolis. Since then, the development of the Naval Academy has reflected the history of the United States. As our country has changed culturally and technologically, so has the

Naval Academy. In just a few decades, the Navy has moved from a fleet of sail and steam powered ships to a high-tech fleet with nuclear powered submarines and surface ships and supersonic aircraft. The academy has changed, too, giving midshipmen the up-to-date academic and professional training they need to be effective naval officers in their assignments after graduation.

In 1850 the Naval School became the United States Naval Academy. A new curriculum went into effect requiring midshipmen to study at the academy for four years and to train aboard ships each summer. That format is the basis of a far more advanced and sophisticated curriculum at the Naval Academy today. As the U.S. Navy grew over the years, the academy expanded. The campus of 10 acres increased to 338. The original student body of 60 midshipmen grew to a brigade size of 4,200 midshipmen. Modern granite buildings replaced the old wooden structures of Fort Severn and the Naval School.

Congress authorized the Naval Academy to begin awarding bachelor of science degrees in 1933. The academy later replaced a fixed curriculum taken by all midshipmen with the present core curriculum plus 18 major fields of study, a wide variety of elective courses and advanced study and research opportunities.

The Naval Academy first accepted women as midshipmen in 1976 when Congress authorized the admission of women to all of the service academies. Women comprise about 11 to 12 percent of entering plebes -- or freshman -- class, and they pursue the same academic and professional training as do their male classmates.

"The mission helps remind us daily why we are here. Sometimes in our daily struggles we can lose sight of the big picture."

Mission

The Naval Academy has a unique clarity of purpose, expressed in our official mission: "To develop midshipmen morally, mentally and physically and to imbue them with the highest ideals of duty, honor and loyalty in order to provide graduates who are dedicated to a career of naval service and have potential for future development in mind and character to assume the highest responsibilities of command, citizenship and government." This puts everyone -- faculty, staff and midshipmen -- on the same wavelength. It also encourages a sense of spirit and pride found at few other schools.

Program

The moral, mental and physical elements of our program are equally important, all contributing to the qualities of an outstanding naval officer.

Academics

Every midshipman's academic program begins with a core curriculum that includes courses in engineering, science, mathematics and the humanities. This is designed to give you a broad-based education that will qualify you for practically any career field in the Navy or Marine Corps. At the same time, our majors program gives you the opportunity to develop your particular area of academic interest.

For especially capable and highly motivated students, we offer challenging honors programs and opportunities to start work on postgraduate degrees while still at the academy.

Professional and leadership training

We don't just tell you about life in the Navy and Marine Corps. Over four years at the Naval Academy, the life and customs of the naval service become second nature. First, you learn to take orders from practically everyone. But, before long, you acquire the responsibility for making decisions that can affect hundreds of other midshipmen. Your professional classroom studies are backed by many hours of practical experience in leadership and naval operations, including assignments with Navy and Marine Corps units during summer months.

Moral education

As future officers in the Navy or Marine Corps, midshipmen will someday be responsible for multi-million dollar equipment and the priceless lives of many men and women. By necessity, an unwavering tradition of honor and integrity is a foundation of the Naval Academy. In 1951 the midshipmen formulated the Honor Concept: "Midshipmen are persons of integrity; they do not lie, cheat or steal."

These are not hollow words at Navy, where the midshipmen continue to operate a strict honor system. Composed of elected upperclass midshipmen, the Brigade Honor Committee conducts hearings for those midshipmen suspected of violating the Honor Concept. Violations of the Honor Concept may lead to separation from the Naval Academy.

Taught from the first day that their word must be true, midshipmen enjoy the privileges of living in an environment of mutual trust and respect.

Physical training

We teach the importance of being physically fit and prepared for stress because the duties of Navy and Marine Corps officers often require long, strenuous hours in difficult situations. The physical requirements of Plebe Summer training, four years of physical education and year-round athletics also develop pride, teamwork and leadership.

Profile of Midshipmen

It takes a special kind of young man or woman to handle the Naval Academy's demanding program, but that doesn't mean all midshipmen are alike. Midshipmen come from all 50 states, U.S. territories and several foreign countries. They have roots in cities, suburbs, farms and ranches, small towns and military bases. They have talents and hobbies of every kind and personalities that fit every description. And, they represent the diverse ethnic and cultural heritages that, together, make the United States a great nation. Some characteristics seem to be common among Naval Academy midshipmen, however. The charts on these pages show you that midshipmen are good students, leaders in their high schools and communities and interested in athletics. But other common qualities of midshipmen don't show up in statistics. The young men and women who choose the Naval Academy are looking for more than a college degree. They like the idea of being challenged mentally, physically and personally. They are people who don't want to settle for the ordinary, the routine or the easy.

Midshipmen are also patriots. They want to serve their country in a meaningful way -- in a profession that helped win this nation's independence more than 200 years ago. Finally, midshipmen are young people who look to the future. They see the opportunities available at the Naval Academy, as well as the exciting possibilities open to them in the Navy and Marine Corps after graduation.

The Class of 1995

Applicants and Nominees

Applicants (includes nominees)	11,588
Number of applicants with an official nomination	5,411
Nominees qualified scholastically, medically and in physical aptitude	1,973
Offers of admission	1,385
Admitted	1,133

Scholastic Aptitude Test Scores

Score Range	*Verbal*	*Math*
>700	5%	31%
600-699	30%	55%
500-599	46%	13%
<500	19%	1%

American College Testing Program Scores

Score Range	*English*	*Math*
30-36	10%	63%
25-29	54%	36%
20-24	35%	1%
15-19	1%	0%

School Honors and Activities

	Percent
Student body/council/government president or vice president	12
Class president or vice president	14
School club president or vice president	32
School publication staff	26
National Honor Society	56
Varsity athletics	86
Varsity letter winner	81
Dramatics, public speaking, debating	66
Leader of musical group	9
Eagle Scout/Gold Award	8
Boys/Girls State or Nation	21
Reserve Officer Training Program	9
Sea Cadets	2

Rank in High School Class

First fifth	81%
Second fifth	14%
Third fifth	4%
Fourth fifth	1%

Previous College and Prep School

The Class of 1995 includes 34 percent (388) from college and post-high school preparatory programs; 18 percent (208) from the Navy Preparatory Schools; 7 percent (79) from private preparatory schools; and 9 percent (101) who have completed at least six months of study at a college or university.

Geographical Distribution

Midshipmen were admitted from every state in the nation. The Class of 1995 also includes eight international students from the following countries: Egypt, Honduras, Korea, Nigeria, Pakistan, Philippines, Singapore and Turkey.

Minorities and Women

The Class of 1995 includes a total of 227 minority midshipmen with ethnic backgrounds as follows: Black (84), Asian/Pacific Islander (33), Filipino (16), Hispanic (80), and Indian/Native American (14). Admitted with the Class of 1995 were 146 women.

Sons and Daughters of Alumni

The Class of 1995 includes 37 sons and four daughters of Naval Academy alumni (4 percent of the class).

Geographic Distribution of Midshipmen

Fifty States and the District of Columbia

Alabama	58
Alaska	13
Arizona	56
Arkansas	23
California	491
Colorado	47
Connecticut	62
Delaware	13
District of Columbia	12
Florida	245
Georgia	108
Hawaii	18
Idaho	18
Iowa	43
Illinois	130
Indiana	65
Kansas	28
Kentucky	44
Louisiana	38
Maine	30
Maryland	257
Massachusetts	89
Michigan	120
Minnesota	58
Mississippi	34
Missouri	51
Montana	22
Nebraska	18
New Hampshire	27
New Jersey	173
New Mexico	28
Nevada	15
New York	290
North Carolina	74
North Dakota	14
Ohio	166
Oklahoma	39
Oregon	43
Pennsylvania	268
Rhode Island	34
South Carolina	64
South Dakota	12
Tennessee	54
Texas	259
Utah	19
Vermont	10
Virginia	253
Washington	80
West Virginia	33
Wisconsin	62
Wyoming	18

U.S. Territories

Guam	2
Puerto Rico	12
Virgin Islands	2

Foreign Countries

The brigade includes 40 midshipmen from 22 foreign nations.

Our Commitment

Setting apart the Naval Academy from almost every other college and university in the country is our commitment to the total development of our students. Some other colleges offer more majors in academics. Some put more emphasis on intercollegiate athletics. But nowhere else do you have a better opportunity to grow intellectually, personally and physically than at the Naval Academy. If you are chosen to enter the Naval Academy, we believe you can complete this tough, four-year program. In fact, we are committed to the principle of helping every midshipman succeed. We back up that commitment with . . .

- small class size. Most classes have no more than 22 students. When you are an upperclassman, some courses in your major may have only five to 10 other students.

- low student-to-faculty ratio. Faculty members get to know you personally in and out of the classroom. They also are available to help with extra instruction or special projects until 11 p.m. every weeknight. It's not unusual to find professors and midshipmen burning the late-night oil together in an academy research lab or at a computer terminal.

- protected study time. Evening study period is reserved from 7:15 p.m. to midnight Sunday through Friday to help all midshipmen keep up with their courses. Additionally, Nimitz Library, computer labs and other facilities are open for midshipmen use all day and evening, seven days a week.

"The decision to come here is a difficult decision that carries many consequences. The bottom line is that you have to want it for yourself."

- academic advising. To help you plan your curriculum, you get group and individual counseling as well as an academic adviser early in plebe year. A permanent faculty adviser is assigned when you select your major.

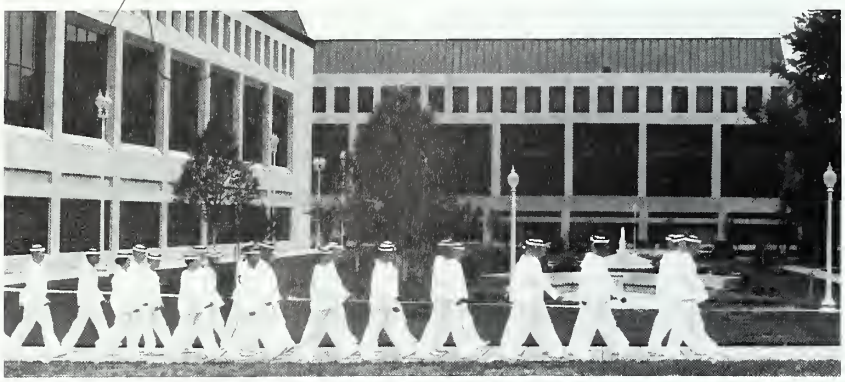
- leadership and counseling. Your company officer and senior midshipmen also guide, monitor and evaluate your progress in academics, as well as military performance and conduct. They also are ready to help in the event of problems, as are the academy's staff of chaplains and professional counselors.

- a sponsor program. Hundreds of families in the Annapolis area sponsor newly-arrived midshipmen, offering a home away from home and a place to relax off-campus. More than enough families volunteer to give every midshipman a local sponsor. These contacts often grow into deep friendships that last a lifetime.

Your Commitment

Becoming a midshipman at the Naval Academy is a big step. It's not like starting your freshman year at a civilian college. You make a commitment to live a military lifestyle. You take an oath of office, promising to be loyal to your country and to defend it if necessary. You agree to be honorable in everything you do and say. You're also expected to work harder than you've ever worked before and to push yourself beyond your old limits. This is how we prepare you for the challenging responsibilities of service as a naval officer and the opportunities of a lifetime in the Navy and Marine Corps.

"My goal is to be the best naval officer, so I decided on the institution that exposes me to 24-hour-a-day leadership training."



Admissions

Competition to become a midshipman is keen, but if you have prepared yourself for a challenging, multi-dimensional four-year program and want to serve with distinction as a leader in the Navy or Marine Corps, you should apply.

Applying to enter the Naval Academy is a necessarily thorough process. Besides reviewing your academic record, our admissions board will evaluate your medical and dental health, physical fitness, leadership potential and motivation to be a midshipman and an officer in the naval service. You must be recommended by teachers, interviewed by an academy representative and nominated by at least one of the nomination sources. Do not let the nomination requirement scare you; we'll help you through the nomination process starting on page 16.

We want to ensure that the best qualified candidates from around the United States are selected for admission and that those who are selected have the potential to complete the four-year program. All candidates have an equal opportunity, and eligible men and women are strongly encouraged to apply. The number of minority group members in recent years has risen to about 20 percent of each class entering the academy. Women make up about 12 percent of each new class.

Naval Academy Dean of Admissions John Renard has a long association with the Naval Academy. He graduated from the academy with the Class of 1955 and returned to Annapolis later in his Navy career to serve as a battalion officer and then as executive assistant to the superintendent. As a retired Navy captain, he became dean of admissions in May 1985.

"The Naval Academy is unique in that we attempt to select and admit young men and women for a career, not just a college.

"Members of the admissions board spend countless hours reviewing candidate records. This is a tough job because most of the candidates applying for the Naval Academy are achievers: highly motivated, well-rounded students who excel not only academically, but also in athletics and in extracurricular activities.

"I personally believe that all of the candidates we accept can successfully complete the program if they maintain their desire and motivation. In fact, for the last 10 years, we have averaged a graduation rate of 77 percent. I think this is attributable to the combination of our taking great care to match candidates to our program, and then helping them succeed while they are here."

Eligibility Requirements for Applying to the U.S. Naval Academy

You must be:

- at least 17 years of age and must not have passed your 22nd birthday on July 1 of the year of admission;
- unmarried, not pregnant and have no legal obligation to support a child, children or other individual;
- a United States citizen (except for the limited quotas of international midshipmen specifically authorized by Congress); and
- of good moral character.

Other Qualifications Necessary for Admission

You must:

- be found scholastically qualified by the admissions board;
- be medically qualified;
- pass the Naval Academy's Physical Aptitude Examination or similar test for USMA, USAFA; and
- receive an official nomination from one of many sources available (see pages 16-21).

How to Become Competitive for Admission

To improve your chances of qualifying scholastically, your high school preparation should include the following:

- mathematics -- four years of mathematics courses, including a strong foundation in geometry, algebra and trigonometry. Experience in calculus is good, but not at the expense of these basic fields.
- science -- one year of chemistry and one year of physics.
- English -- four years of course work with special attention to the study and practice of effective writing. Surveys of English and American literature are especially helpful as background for future study of literature.
- modern foreign language -- at least two years. Course work should include regular use of the spoken language and encompass elementary syntax and grammar. Four years of a single foreign language, if possible, would also prove helpful.
- history -- one full year of U.S. history and, where possible, a full year of European or world history.
- introductory computer and typing courses are recommended because all midshipmen are required to use personal computers in most of the academy's courses.

To demonstrate your ability to meet the physical and time demands of four years at the Naval Academy, you should take part in athletic and non-athletic extracurricular activities. Since every midshipman is involved in physical exercise every day at the academy, it is important that you get in good

"The Naval Academy is not out to gather a group of 1,200 clones and turn them into officers. The idea is to admit 1,200 individuals who will each contribute a unique characteristic to the Navy-Marine Corps team."

physical condition while still in high school. Plebe Summer is not the time to try to whip yourself into shape. Since we are also interested in your leadership potential, as well as your ability to manage your time, we will look at your non-athletic activities and record of part-time employment or military service to evaluate your versatility and ability to accept responsibility. And by all means, stay away from illegal drugs and abuse of alcohol.

"The best advice I can give to someone applying here would be to apply as early as possible. When I received my appointment they even told me that my expediency in applying really gave me an edge."

Steps Toward Gaining Admission

1. You should apply for admission between April 1 of your junior year in high school and February 28 of your senior year in high school. Since many congressmen and senators begin processing nomination requests during the summer and fall, the earlier you apply the better. You can also apply from college or the military service if you meet age requirements. In all cases, ask for information and a Precandidate Questionnaire by calling the Candidate Guidance Office at 1-410-267-4361, or by writing: Candidate Guidance Office, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5018. Admissions information can also be obtained by sending in the pre-franked information card contained in the front of this catalog.

2. Obtain a social security number, if you do not already have one.

3. Fill out and return the Precandidate Questionnaire to the academy. Based on the information in the questionnaire, particularly scholastic achievement, the Candidate Guidance Office will advise you whether your present record is strong enough to be competitive for admission. If so, you will be identified as an official candidate.

4. Apply for a nomination. (See pages 16-21.)

5. Take the SAT or ACT college admission tests. For admission purposes, the academy averages all SAT or ACT scores of tests taken after December of your junior year in high school. See the SAT and ACT schedules below.

6. If you are named a candidate, you will receive a complete candidate application packet as early as September of your senior year of high school. ***You should complete the enclosed forms and return them to the academy as soon as possible.*** As soon as all your candidate packet forms are received by the academy, the admissions board will review your application to determine your scholastic qualification.

7. Take the Physical Aptitude Examination. (See page 16.)

8. Take the Qualifying Medical Examination. (See pages 16 and 152.)

9. Interview with a Naval Academy Information (Blue and Gold) Officer in your area. (See pages 28-31 for a listing of Blue and Gold area coordinators.)

10. If you have any questions about your candidacy at any point during the admissions process, call your Blue and Gold Officer.

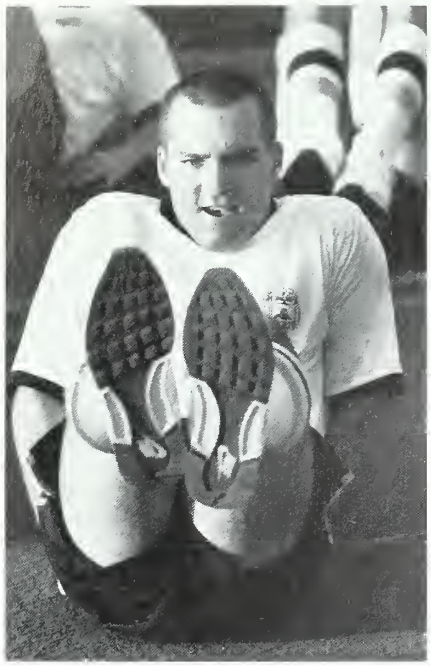
Schedule of Test Dates, 1992-93 *(Check dates with your high school counselor)*

American College Testing (ACT)

Test Date:	*Registration Deadline Date:*
June 13, 1992	May 15, 1992
October 24, 1992	September 25, 1992
December 12, 1992*	November 13, 1992

* *Last ACT which may be taken for Naval Academy Class of 1997.*

Note: The College Code Number to be used to forward your ACT test scores to the Naval Academy is 1742.



"The physical training and athletics here are unbelievably rigorous. The athletics are especially exciting because most everyone gives 150% of themselves to sports. It's a way to work off stress."

College Board Scholastic Aptitude Test (SAT)

Test Date :	*Registration Deadline Date:*
May 2, 1992	March 27, 1992
June 6, 1992	May 1, 1992
October 10, 1992*	September 11, 1992
November 7, 1992	October 2, 1992
December 5, 1992	October 30, 1992
January 23, 1993**	December 18, 1992

** Not offered in all states*

*** Last SAT which may be taken for the Naval Academy Class of 1997.*

Note: The College Code Number to be used to forward your SAT test scores to the Naval Academy is 5809.

Physical Aptitude Examination

All candidates must pass a standard Physical Aptitude Examination (PAE) to qualify for admission to the academy. The PAE tests your coordination, strength, speed and agility. If you are physically fit, the PAE should present no problem. ***Because competition for admission to the academy is stiff and the admissions board reviews the PAE score, you will want to do your best.***

The candidate admissions packet gives you details of the PAE, which may be administered by a teacher or school official with a degree in physical education or by a commissioned military officer on active duty.

Medical Exam and Physical Considerations

Because the Naval Academy's program is physically demanding and Navy and Marine Corps officers must meet certain medical standards, we require all candidates for admission to pass a thorough medical exam. These exams are scheduled for candidates through the Department of Defense Medical Examination Review Board.

Generally speaking, healthy candidates with normal vision have little difficulty passing the exam. However, the exam sometimes identifies characteristics or problems that could be aggravated by the academy's rigorous routine or that would prevent military service after graduation. Some specific medical considerations are discussed in Appendix A.

Obtaining a Nomination

All applicants must have a nomination from an official source in order to be considered for appointment to the Naval Academy. There are many sources of nomination and applicants should apply to all sources for which they are eligible. This normally includes a U.S. representative, two U.S. senators and the vice president of the United States. See the sample letters on pages 20 and 21.

You should apply for a congressional nomination during the spring of your junior year in high school, or as soon thereafter as possible. This is because many members of Congress evaluate candidates during the summer months and make their decisions in early fall, though the academy accepts nominations until the end of January. Applicants for military service-connected nominations (as described in following paragraphs) should apply directly to the Naval Academy for a nomination after July 1 of the year prior to admission.

Nomination sources
Applicants may seek nominations from the following sources:

U.S. senators, representatives, the delegate to Congress from the District of Columbia, the resident commissioner of Puerto Rico.

Each member of Congress can have five constituents attending the Naval Academy at any one time. When a constituent leaves the academy, a vacancy is created. Members may use any one of these methods for nominating candidates to fill their vacancies:

- nominate 10 candidates for each vacancy, permitting the Naval Academy to evaluate and rank them for admission;
- designate one principal nominee and nine other candidates as alternates, ranked in order of preference; or
- nominate one principal nominee and nine other candidates as competitors, permitting the Naval Academy to rank the competitors for admission.

In each of these methods, a fully qualified nominee is offered an appointment to the Naval Academy to fill the vacancy. The remaining fully qualified nominees also are considered carefully and many are selected for admission from a national list of qualified alternates.

Application dates: spring of your junior year (or spring of the year prior to desired admission), or as soon thereafter as possible.

Apply to: both of your U.S. senators and to the representative from your home congressional district. It is not necessary to know the official personally. See page 20 for sample letter.

The governor of Puerto Rico and the delegates to Congress from Guam, the Virgin Islands and American Samoa

Puerto Rico and Samoa may each have one midshipman attending the Naval Academy. Guam and the Virgin Islands each may have two at the academy. Ten nominations are permitted for each vacancy.

Apply to: the appropriate official.

The President

An unlimited number of presidential nominations are available for children of career officer and enlisted personnel of the armed forces, including the Coast Guard, and 100 candidates are appointed from these nominations each year. The parent must either have served continuously on active duty for at least eight years and still be serving, or be retired from active duty with pay. Adopted children also are eligible.

Application dates: between July 1 and January 31 of the year prior to admission.

Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office.

"If you're accepted to the Naval Academy, you can graduate. The question is one of will. Will you do whatever it takes to make it? Every appointee has the potential."

Students must apply directly to the academy for this nomination. See page 21 for sample letter. Be sure to submit proper documentation to support your eligibility.

The Vice President

At any one time, five midshipmen may attend the academy based on a vice presidential nomination. Competition for a vice presidential nomination is very keen. Application deadline: November 1 of the year prior to induction as a midshipman.

Apply to: Office of the Vice President, Washington, DC 20501. Send only your letter of application directly to the vice president's office. Transcripts and other supporting material should be sent to the Admissions Office, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5017, Attn: Vice Presidential Applicant. See page 20 for sample letter.

Regular Navy and Marine Corps

Eighty-five appointments are available annually to active duty Navy and Marine Corps enlisted personnel. For more information, see your command's career counselor. Application deadline: January 31; see OPNAVINST 1531.4E or Marine Corps Order 1530.11.

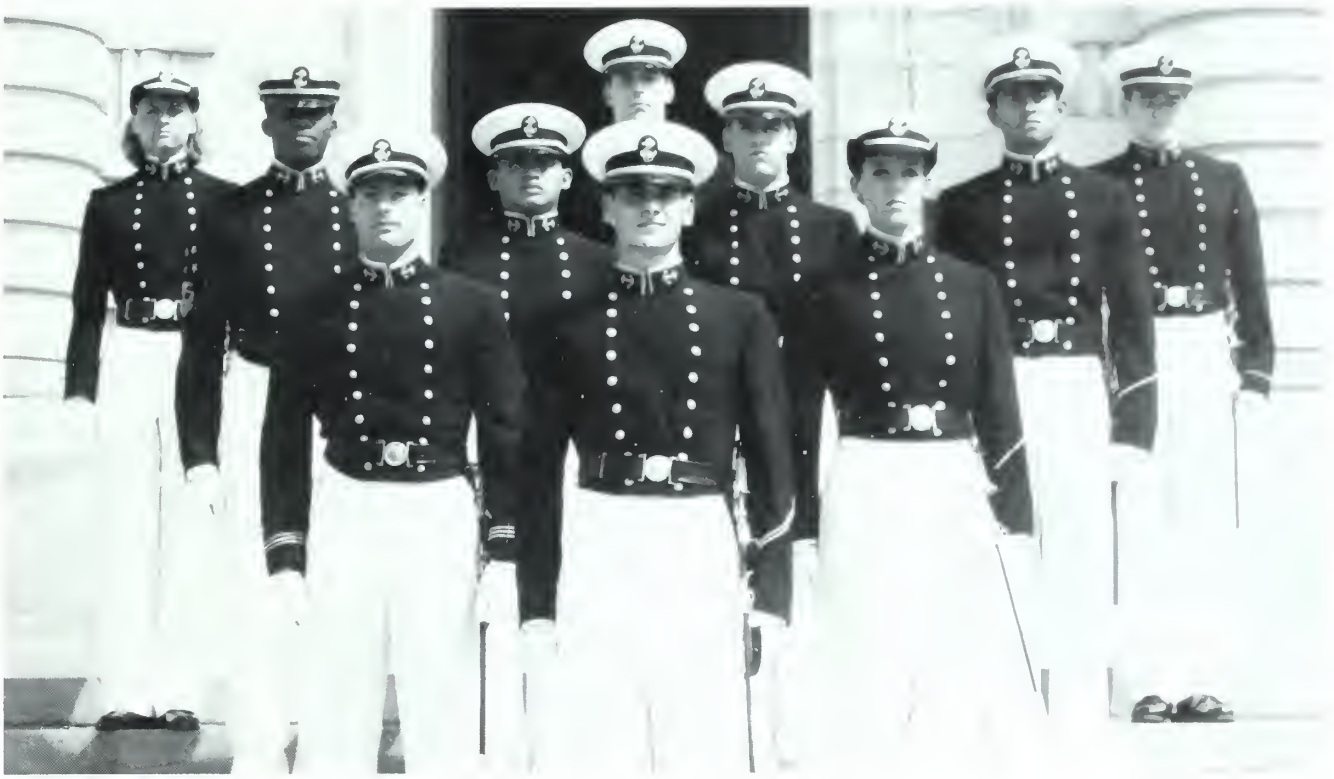
Apply to: the Naval Academy via your commanding officer.

Navy and Marine Corps Reserve

Eighty-five appointments are open annually to Navy and Marine Corps reserve enlisted personnel who are on active duty or are assigned to a drilling unit. Application deadline: January 31; see OPNAVINST 1531.4E or Marine Corps Order 1530.11.

Apply to: the Naval Academy via your commanding officer.

"Fleet experience helps you see beyond the Naval Academy and allows you to form more accurate opinions of possible career paths."



Naval Reserve Officers Training Corps (NROTC, NJROTC, MCJROTC); Honor Naval and Military Schools

Twenty appointments annually are available through nominations from these programs.

Apply to: your senior military instructor, professor of naval science or headmaster.

Children of deceased or disabled veterans and children of prisoners of war or servicemen missing in action

Up to 65 midshipmen may attend the academy at one time based on nominations as children of military personnel who were killed in action; died from wounds, injuries or disease while on active duty; sustained 100 percent disability from such wounds, injuries or disease, as certified by the Department of Veterans Affairs; or who are currently prisoners of war (POW) or missing in action (MIA). The children of civilians in POW or MIA status also are eligible. Adopted children are eligible. Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office.

Children of Medal of Honor Awardees

Candidates in this special category who are fully qualified for admission are automatically appointed. There is no limit to the number of midshipmen who may be at the academy with this source of nomination.

Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office.

"Getting admitted into the U.S. Naval Academy is a great accomplishment in itself, but it is just the first small step of many things to come.."

Sample letters
Requesting a Congressional or Vice Presidential Nomination

The Vice President
The White House
Washington, DC 20501

The Honorable_____
House of Representatives
Washington, DC 20515

The Honorable_____
United States Senate
Washington, DC 20510

Dear Mr. Vice President or Senator_____ *(Senate)* or Mr./Mrs./Ms./Miss _____: *(House of Representatives)*

It is my desire to attend the United States Naval Academy. I respectfully request that I be considered as one of your nominees for the class entering in July 1993.

The following personal data are provided for your information:

Full name:_____
(Print as recorded on birth certificate)

Name of parents:_____

Address: *(Use ZIP code and provide phone number)*

Permanent_____ Mailing_____
_____ _____
_____ _____
Telephone_____ Telephone_____

Date of birth:_____ Place of birth:_____

Social Security number:_____

High school attended:_____
(Name and address)

Date of high school graduation: _____ Sex:_____

My approximate standing is_____ in a class of_____.

I have/have not sent a Precandidate Questionnaire to the Naval Academy.

I have requested my high school transcript of work completed to date to be forwarded to your office as soon as possible. I have also listed on the reverse side the results of any ACT or SAT test scores that I have taken.

I have been active in high school extracurricular activities as indicated on the reverse side. I should greatly appreciate your consideration of my request for one of your nominations.

Sincerely yours,
(Signature)

Notes: Do not forward transcripts/supporting letters to the vice president's office. Forward to the Admissions Office, United States Naval Academy, marked "Vice Presidential Applicant."

Prospective candidates should apply to their U.S. representative and to both of their U.S. senators.

If you have not already completed and submitted a Precandidate Questionnaire, request one by writing the Candidate Guidance Office, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5018, or by calling 1-410-267-4361 at the same time that applications for congressional nominations are submitted.

Sample letter
Requesting a Presidential Nomination

(This application should be submitted after July 1 of the year preceding desired year of entry and before January 31 of the year of entry.)

To: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Officer

Dear Sir: Date:_____

I request a presidential nomination to the United States Naval Academy for the class that will enter in July 1993 and I submit the following data:

Name: _____
(Give full name as shown on birth certificate or, if changed, attach copy of court order.)
Address: *(Use ZIP code and provide phone number)*

Permanent_____ Mailing_____
_____ _____
Phone_____ Phone_____

Date of birth:_____
Social Security number *(must be filled in)*:_____
Name and address of high school/college:_____
Month/year of graduation: _____ Sex:_____
Ethnic origin:_____*Black, Oriental, Hispanic, native American (American Indian and native Alaskan), Puerto Rican, Caucasian, etc.*
Congressional district & state: _____
Applying to Congressmen (names) :_____
Highest scores: PSAT V_____ , M_____ ; SAT V_____ , M _____ ;
ACT E_____ , M _____

Uncorrected vision: Right 20/_____ , Left 20 ____ , Corrected R 20/____ , L 20/____

If member of military, check here___. List rank, serial number, component, branch of service, and organizational address on reverse side of this form.

Information concerning parents' military service:
Name of parent/s:_____
(Parent's rank, serial number, component, and branch of service; if parent is retired with pay please indicate)

Sincerely yours,
(Signature)

Note: In establishing your eligibility for a presidential nomination, you should determine which of the following three service-connected categories applies to your parent and forward supporting documents and information to the Naval Academy along with your letter of application for a nomination. If you have not already completed and submitted a Precandidate Questionnaire, request one from the Candidate Guidance Office, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5018, at the time you apply for a presidential nomination.

- **Active duty officer: attach statement of service prepared by personnel officer specifying all periods of active duty.**
- **Active duty enlisted: attach statement prepared by personnel officer specifying all periods of active duty and listing dates of enlistment and dates of expiration of enlistment.**
- **Retired or deceased: furnish data and copy of retirement order or casualty report. If appropriate, include brief statement concerning the date, place and cause of death or details of disability together with the Veterans Administration claim number. If eligible, applicant will be given a nomination in the children of deceased or disabled veterans category.**

Selection for Appointment

If the Naval Academy admissions board finds you qualified scholastically, physically and medically and you've obtained a nomination, you become one of the approximately 2,000 candidates to reach this stage. Of that number, around 1,400 are offered appointments, with about 1,200 accepting and becoming midshipmen.

Offers of appointment and our form of an early offer (called a Letter of Assurance) are made beginning in October and continue through the following spring. Nearly all appointments are offered by May 15. Files not completed by March 21 will be closed from further consideration.

Naval service obligation

When you are offered an appointment, we send you several important documents and forms to consider and complete. One of the most important for United States citizens is the Agreement to Serve. This agreement, required by U.S. law (Title 10, U.S. Code, Sections 6959 and 2005) and other directives, outlines your service obligation and is signed on Induction Day in July at the Naval Academy. It requires the consent of parents or guardian if you are a minor. In signing the Agreement to Serve, you state that you will:

- complete the four-year course of instruction at the Naval Academy.
- accept an appointment and serve on active duty as a commissioned officer of the Regular Navy or Marine Corps for at least six years immediately after graduation.
- accept an appointment as a commissioned officer in the reserve component of the Navy or Marine Corps and remain therein until the eighth anniversary of graduation from the Naval Academy if an appointment as a commissioned officer in the regular component is not tendered at graduation or if you resign as a commissioned officer of the regular component before the eighth anniversary.
- serve in an appropriate enlisted grade on active duty for not more than four years if you do not fulfill the paragraphs agreed to above.

"My time is the most valuable asset, I have given it all to my country in its service by saying the words, '.. to support and defend the Constitution of the United States...'"

- reimburse the United States for the cost of education received at the Naval Academy if you voluntarily, or through misconduct, fail to complete a period of active duty specified above.

"You need to have a strong sense of commitment in order to be successful here. There are many demanding things here that only a strong commitment will get you through."

Oath of Office

The appointment information also includes a copy of the Oath of Office which must be signed and agreed to orally by U.S. midshipmen on Induction Day:

"I,_____, having been appointed a midshipman in the United States Navy, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office on which I am about to enter, so help me God."

Resignations and separations

If you enter the Naval Academy directly from civilian life, you assume a military obligation according to the Agreement to Serve. Midshipmen who do not fulfill this agreement could be transferred to the Naval or Marine Corps Reserve in an enlisted status and ordered by the Secretary of the Navy to serve on active duty for a period not to exceed four years, as provided by Title 10, U.S. Code, Section 6959. However, in practice, the following policies currently apply to midshipmen who enter the academy from a civilian status:

- if you are discharged, or your resignation is accepted before the first day of classes of your second-class (junior) year, you are discharged from the naval service.
- if you leave the academy after beginning the academic year as a second-class midshipman (junior) but before the start of first-class year, you are obligated to serve for two years in an enlisted status unless you are considered physically disqualified, unfit or unsuited for military service.
- if you leave the academy after the start of first-class (senior) academic year, you have a three-year obligation to serve in an enlisted status.
- if you refuse a commission upon graduation, your enlisted service obligation is four years.

"On the first day of plebe summer all I saw was a group of high school students with nameless faces. On the last day of that summer I saw 36 of my closest friends."

If you enter the Naval Academy from the regular or reserve component of the Navy or Marine Corps, including the Naval Academy Preparatory School, the remaining period of your enlistment or obligated service is not terminated when you accept an appointment to the academy. Therefore, if you do not fulfill the Agreement to Serve, you will return to enlisted status to complete the period of service for which enlisted or obligated, as provided by Title 10, U.S. Code, Section 516. In calculating the unexpired part of an enlistment or period of obligated service, time as a midshipman is counted as service under that enlistment or service obligation. However, if you are discharged or your resignation is accepted after beginning your second-class academic year at the Naval Academy, you incur the same obligations described above for those who enter the academy from civilian life.

In either case, if you leave the Naval Academy after the start of your second-class year or refuse a commission upon graduation and do not complete the active-duty service obligation, whether voluntarily or through misconduct, you can be required to reimburse the United States for the cost of education received at the Naval Academy. This cost is computed by the Naval Academy and includes the costs of professors' salaries, supplies and other expenses. It is comparable to the tuition at a first-rate private university. The amount to be reimbursed in a particular case varies proportionally with the period of unserved obligation, ranging up to the entire cost of education.

Costs and financial obligations

Before entering the Naval Academy, you must deposit $1,500 to be used as partial payment for your uniforms and supplies, including a personal computer. In cases of extreme hardship, the deposit may be reduced or waived by the academy and then made up through deductions from pay over four years as a midshipman. All appointees who request an entrance deposit waiver must complete the college scholarship service financial aid form and submit the form to the scholarship service address shown on the form instructions.

A $1,500 interest-free loan from the federal government is advanced to entering midshipmen to help defray first-year costs not covered by the deposit. This loan is repaid through monthly deductions from midshipmen pay during the four years at the academy.

If you voluntarily leave the Naval Academy before repaying these and any other obligations, you must pay the debts in full before separation. If you are separated involuntarily, you must turn in enough uniforms and equipment suitable for reissue to pay your debts. If these reclaimed items don't cover your indebtedness, you must pay the difference.

Reporting for Induction Day

If you accept an appointment to the Naval Academy, you will report for induction in early July, take the Oath of Office and begin Plebe Summer with your new classmates from around the nation. It will be one of the biggest days in your life. We will tell you what you need to bring and how to make travel arrangements to Annapolis.

Documentation of citizenship

Prior to Induction Day in July, appointees must have proof of United States citizenship on file at the Naval Academy. Certificates must be an original notarized copy. Any of the following documents are acceptable:

a. Birth Certificate
b. Certificate of Citizenship
c. Immigration and Naturalization Certificate

Name changes must be documented by a court order. Appointees without proof of citizenship on file will not be given the Oath of Office.

Visiting the Academy

A personal visit to Annapolis can help you make a decision about attending the Naval Academy. You and your family are encouraged to tour the academy any day of the year during regular visiting hours, 9 a.m. to 5 p.m. You can take a guided tour with a commercial service in Annapolis or through the academy's own Visitors Center, which offers tours hourly from 9 a.m. to 4 p.m. every day from March 1 to Thanksgiving weekend.

Our admissions staff does not conduct guided tours, but admissions officers located in Leahy Hall are available to answer your questions from 9 a.m. to 4:30 p.m., Monday through Friday, and from 9 a.m. to noon on Saturday. No appointment is necessary. Once you are a candidate for admission, several special programs are available to give you a close look at midshipmen life:

Bancroft Hall Candidate Visitation Program -- This is a program for highly competitive candidates who are likely to receive appointments. It is a chance to spend one weekend with the Brigade of Midshipmen. During specific weekends between October and April, from 9 a.m. on Friday until 6:30 p.m. on Saturday, you live with your midshipman host, attend classes, eat in King Hall and sleep in Bancroft Hall. Admissions personnel will contact qualified candidates regarding this visit opportunity.

Academy Admissions Day -- For 9th, 10th and 11th graders, the academy will hold an Academy Admissions Day in the fall for high school students living within driving distance of the academy.

Alternate Routes to Admission

If you are not selected for a direct appointment to the Naval Academy, the academy's admissions board automatically considers you for selection to the Naval Academy Preparatory School or recommends you for a Naval Academy Foundation preparatory school scholarship. You do not need to apply directly for either preparatory program.

"I was in college when I decided that I wanted to serve my country as a naval officer. So I came to the Naval Academy and started over. To become the finest naval officer I could be, I knew I had to graduate from the academy."

Naval Academy Preparatory School (NAPS)

Located in Newport, R.I., NAPS offers a 10-month college preparatory course to active duty and reserve Navy and Marine Corps enlisted men and women who are seeking Naval Academy appointments. This program is designed to strengthen the academic background of incoming candidates. Navy and Marine Corps personnel who apply but are not appointed to the Naval Academy are automatically considered for admission to NAPS. The academy also identifies a number of promising and highly motivated civilian candidates who are not successful on their first attempt at admission and offers them the opportunity to enlist in the Naval Reserve for the express purpose of attending NAPS to prepare for admission to the Naval Academy.

U.S. Naval Academy Foundation

The U.S. Naval Academy Foundation, Inc., also helps promising candidates who are not appointed in their first try for admission. This nonprofit organization awards a limited number of scholarships for post-high school preparatory studies to enhance those candidates' qualifications for admission.

The Naval Academy's admissions board automatically recommends candidates to the Foundation for sponsorship consideration. No special request is required.

Cash grants are made to the participating junior college, prep school or college selected. Parents of applicants are expected to contribute within their means.

Each entering class includes about 90 Foundation scholarship candidates. Candidates who successfully complete the Foundation program will normally be offered an appointment to the Naval Academy.

Other Considerations

Appointments of women

In 1976 Congress authorized women to enter the service academies, and 81 women were admitted with the Naval Academy Class of 1980. Great strides have been made since 1976 to fully integrate women into the Brigade.

Women comprise 11 to 12 percent of each entering class. Admissions standards are the same as those for men, with the exception of some allowances made for the physical differences between men and women. The number of women admitted each year is based on the needs of the Navy and Marine Corps for women officers. Approximately 450 of the 4,300-member Brigade of Midshipmen are women.

The academy offers women the same opportunities to excel it has extended to men: a challenging academic curriculum to promote intellectual development; a physical training program to build strength, agility and endurance; and a military environment to develop discipline, military skills and leadership.

Previous candidates

If you applied before but were not appointed to the Naval Academy, you may reapply for admission with a subsequent class. The application process is the same. In general, we recommend you retake your SAT or ACT tests. Also, if you take college or prep school courses before reapplying, we suggest you take courses similar to those required of first-year midshipmen.

Readmission of former midshipmen

Former midshipmen desiring to reenter the Naval Academy must obtain a new nomination and requalify medically. In addition to admissions board action, the academy's academic board must agree to readmit former midshipmen. Like any other candidate, you must not be past your 26th birthday on July 1 of the year you would graduate from the academy to be eligible for consideration. Requests should be addressed to the dean of admissions not later than April 1 of the year of desired readmission.

International students

In the interest of international and navy-to-navy relations, the Secretary of the Navy can authorize students from certain countries to enroll at the Naval Academy. Up to 40 of these students may be at the academy at a given time.

Naval Academy Information (Blue and Gold) Officers

The decision to attend the Naval Academy is a big one. Before you make that kind of commitment, you will want answers to many questions about the academy and the naval service. We want to help you make the right decision.

Several resources are available to help you find out all you can about the academy and the professional opportunities available to you after graduation. In Annapolis, the Candidate Guidance Office offers detailed information about the academy's program and admissions procedures. Call the office at 1-410-267-4361 or write to:

Director, Candidate Guidance
United States Naval Academy
117 Decatur Road
Annapolis, Md. 21402-5018

If you live near the West Coast, you also can contact a Candidate Guidance branch office in California by calling (415) 404-4975, or (autovon) 494-4975 or by writing to:

Naval Academy Information Office
Naval Air Station
Moffett Field, Calif. 94035-5017

The Candidate Guidance Office also coordinates a nationwide network of Naval Reserve officers and civilians who are trained as Naval Academy Information, or Blue and Gold Officers. These officers, located in every state, are well qualified to counsel you on all aspects of the Naval Academy. The following state and area coordinators can help you find the name and address of the nearest Blue and Gold Officer. *If you are unable to reach your area coordinator, call the Candidate Guidance Office at 1-410-267-4361.*

State and Area Coordinators

ALABAMA
Rear Admiral John T. Natter
1774 Cornwall Road
Birmingham, Ala. 35226
Phone: Home 205-822-9181; Bus. 205-252-8473
Zip code areas 350-369

ALASKA
Mr. Tom Teshara
Naval Academy Office
NAS Moffett Field, Calif. 94035
Phone: Home 415-589-0247; Bus. 415-404-4975 or (Autovon) 494-4975
Zip code areas 995-999

ARIZONA
Captain Donald F. Strand
3170 Ft. Lowell Road
Tucson, Ariz. 85716
Phone: Home 602-299-3065; Bus. 602-795-0520
Zip code areas 850-869

ARKANSAS
Captain Earl M. Stephen, Jr.
2212 Middleton Drive
North Little Rock, Ark. 72116
Phone: Home 501-753-1439; Bus. 501-753-1439
Zip code areas 716-729

CALIFORNIA
Captain John Gallaudet
2816 Queens Way
Thousand Oaks, Calif. 91362
Phone: Home 805-492-3323; Bus. 805-492-9450
Zip code areas 930-938

Captain Len Kirkeby
2258 San Gorgonio Road
La Canada, Calif. 91011
Phone: Home 818-248-7004; Bus. 213-583-6961
Zip code areas 900-905, 909-916, 918-919, 923-924, 929

Lieutenant Jonas Litonjua
845 Narwhal Street
San Diego, Calif. 92154
Phone: Home 619-575-4767
Zip code areas 920-922

Captain Kent Parsons
518 West Bay Avenue
Balboa, Calif. 92661
Phone: Home 714-673-2548
Zip code areas 906-908, 917, 925-928

Mr. Tom Teshara
Naval Academy Office
NAS Moffett Field, Calif. 94035
Phone: Home 415-589-0247; Bus. 415-404-4975 or (Autovon) 494-4975
Zip code areas 939-951, 954-955

Captain Pietro J. Volpato
577 Paseo Companeros
Chico, Calif. 95928
Phone: Home 916-891-4705; Bus. 916-342-2481
Zip code areas 952-953, 956-961

COLORADO
Captain George H. Linton
6444 East Hampden
Denver, Colo. 80222
Phone: Bus. 303-758-4412
Zip code area 800-819

CONNECTICUT
Commander Paul B. Kraus
Nine Old Long Ridge Road
Stamford, Conn. 06903
Phone: Home 203-322-2663; Bus. 203-323-2663
Zip code areas 060-069

DELAWARE
(AND MARYLAND EASTERN SHORE)
Commander Michael W. Vision
957 Woodland Circle
Annapolis, Md. 21401
Phone: Home 410-974-4522; Bus. 410-347-4369
Zip code areas 197-199, 216, 218

DISTRICT OF COLUMBIA
Lieutenant Commander Kerwin E. Miller
3118 Banneker Drive, N.E.
Washington, D.C. 20018
Phone: Home 202-269-6086; Bus. 202-523-3487
Zip code areas 200, 202-205

FLORIDA
Captain Hugh Wallick Albers
5402 Creeping Hammock Drive
Sarasota, Fla. 34231
Phone: Home 813-922-9211
Zip code areas 326, 335-338, 342, 346
Captain R.V. Christopher
1051 Perdido Manor Drive
Pensacola, Fla. 32506
Phone: Home 904-453-2231; Bus. 904-455-8574
Zip code areas 323-325
Commander Thomas C. Murray
2748 S.W. 9th Street
Fort Lauderdale, Fla. 33312
Phone: Home 305-583-5368
Zip code areas 330-334, 339-340, 349
Dr. Richard Rapson
951 Camelot Road
Maitland, Fla. 32751
Phone: Home 407-647-3339; Bus. 407-867-7048
Zip code areas 320-322, 327-329, 347

GEORGIA
Commander John M. Gates
1307 Berkeley Road
Avondale Estates, Ga. 30002
Phone: Home 404-284-2217; Bus. 404-332-1900
Zip code areas 300-319, 399

HAWAII
Lieutenant Commander James R. Grabe
1101-C Wainiha Street
Honolulu, Hawaii 96825
Phone: Home 808-395-2107; Bus. 808-524-2702
Zip code areas 967-969

IDAHO
Captain Thomas F. Neville
1712 Pomander Road
Boise, Idaho 83705
Phone: Home 208-342-7322; Bus. 208-383-1208
Zip code areas 832-839, 979

ILLINOIS
Captain Richard O. Kay
539 Division Street
Barrington, Ill. 60010
Phone: Home 708-382-1325; Bus. 708-888-5147
Zip code areas 600-608, 610-611
Mr. Charles A. Scherck
9 Gulf Pointe Court
Bloomington, Ill. 61704
Phone: Home 309-662-6576; Bus. 309-766-6509
Zip code areas 609, 612-629

INDIANA
Captain Dean R. Larson
1004 Reyome Drive, Apt 2C
Griffith, Ind. 46319
Phone: Home 219-923-0612; Bus. 708-252-4573
Zip code areas 460-479

IOWA
Commander Franklin B. Gilbert
3100 Douglas Street
Sioux City, Iowa 51104
Phone: Home 712-255-5156
Zip code areas 500-529

KANSAS
Lieutenant Colonel Keith Nadolski
12 Lynwood
Wichita, Kan. 76207
Phone: Home: 316-683-5378; Bus. 316-676-7150
Zip code areas 663-679
Captain James H. Chapman
9218 West 113th Street
Overland Park, Kan. 66210
Phone: Home 913-451-4850; Bus. 816-861-4700
Zip code areas 640-641, 644-645, 647, 660-662

KENTUCKY
Captain Gayle H. Rees
2747 Clintonville Road
Winchester, Ky. 40391
Phone: Home: 606-744-3206; Bus. 606-293-4238
Zip code areas 400-429

LOUISIANA
Captain Lester Alfortish, Jr.
5813 Lafreniere Street
Metairie, La. 70003-2248
Phone: Home 504-889-1000; Bus. 504-888-7171
Zip code areas 700-715

MAINE
Captain Theodore S. Curtis
P.O. Box 400
Orono, Maine 04473
Phone: Home 207-866-2308; Bus. 207-866-4425
Zip code areas 039-049

MARYLAND
Captain Robert B. Serino
12915 Allerton Lane
Silver Spring, Md. 20904
Phone: Home 301-384-8045; Bus. 202-874-5200
Zip code areas 206-209, 215, 217
Commander Michael W. Vision
957 Woodland Circle
Annapolis, Md. 21401
Phone: Home 410-974-4522; Bus. 410-347-4369
Zip code areas 210-214, 219

MASSACHUSETTS
Lieutenant Commander Thomas J. Keating
42 St. Lawrence Ave.
Springfield, Mass. 01104
Phone: Home 413-733-0874; Bus. 413-787-7410
Zip code areas 010-013
Commander John J. Lepore
72 Prospect Street
Melrose, Mass. 02176
Phone: Home 617-662-6791; Bus. 617-397-7248
Zip code areas 014-027

MICHIGAN
Captain Joseph F. Walsh, Jr.
7830 Hartwell
Dearborn, Mich. 48126
Phone: Home 313-581-8437; Bus. 313-473-0880
Zip code areas 480-499

MINNESOTA
Commander Daniel R. Hegman
193 Riverview Acres
Hudson, Wis. 54016
Phone: Home 715-549-6034; Bus. 612-293-8900
Zip code areas 550-569

MISSISSIPPI
Captain Joseph E. Lotterhos
106 Cedar Cove
Clinton, Miss. 39056
Phone: Home 601-924-3227; Bus. 601-944-0466
Zip code areas 386-397

MISSOURI
Captain James H. Chapman
9218 West 113th Street
Overland Park, Kan. 66210
Phone: 913-451-4850; Bus. 816-861-4700
Zip code areas: 640-641, 644-645, 647, 660-662
Captain Nicholas J. Colosi
1914 Time Centre Drive
St. Charles, Mo. 63303
Phone: Home 314-532-2177; Bus. 314-721-0881
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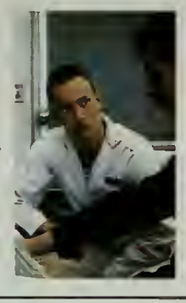
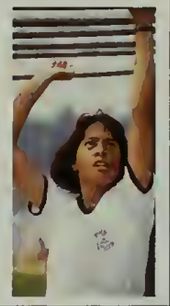
How are the four years organized?

	Plebe Summer	Fourth-Class Year (Freshman)	Third-Class Year (Sophomore)	Second-Class Year (Junior)	First-Class Year (Senior)	Graduation
Education:	Validation exams, initial academic counseling. 	Required courses: calculus, chemistry, computers, leadership, literature, history, naval science, government. You will decide on your major course of study during the second semester of plebe year.	Required courses: naval science, navigation, thermo-dynamics, naval architecture, physics; basic courses in major.	Required courses: electrical engineering, leadership; required courses for major.	Required courses: leadership, weapons systems; required courses for major or special study programs such as Trident Scholars.	Bachelor of science degree awarded in 18 subject areas: 8 in engineering, 6 in science and math, 4 in humanities and social sciences.
Professional Training:	Military orientation, seamanship (sailing), small arms (pistol), physical training.	Courses in naval science and leadership. Hands-on experience with basic shiphandling on board yard patrol craft. Indoctrination to Navy ships and aircraft, military etiquette, Soviet military.	Leadership experience: assist with fourth-class training. Third-class cruise: 8 weeks of training, including 4 weeks with the fleet with enlisted duties.	Leadership experience: in charge of fourth-class and third-class training. Second-class cruise training includes Marine Corps training, surface and submarine cruises and one week of flight orientation at Pensacola, Fla. Professional courses at the academy.	Leadership experience: direct training and activities of the brigade. First-class cruise: 8 weeks of training including 4 weeks with the fleet as a junior officer.	Officer commission as ensign in United States Navy or second lieutenant, United States Marine Corps.
Physical Education and Athletics:	Plebes are introduced to many of the 33 intercollegiate and 30 intramural sports offered at the academy, ranging from pistol and fencing to lacrosse and sailing. Midshipmen choose a sport each season over the four years.	Instruction in golf, lacrosse, gymnastics, crew, soccer, squash, track and swimming. For men, boxing and wrestling For women, fencing and self defense.	Instruction in tennis and swimming. For men only, boxing, wrestling and basics of judo. For women only, combatitive grappling. Tests in applied strength, mile run, swimming and boxing.	Advanced racquetball, swimming, personal conditioning, officiating and hand-to-hand combat. Performance tests given. 	Advanced instruction in swimming and personal conditioning. Electives in sports. Tests in applied strength, obstacle course, mile run and swimming.	
Extra-curricular Activities: (ECAs)		More than 70 recreational, professional and athletic ECAs offered throughout the four years at the academy. Includes club sports of boxing, judo, karate, powerlifting, trap and skeet, rugby, ice hockey, tennis and softball.		Professional and academic ECAs open to all midshipmen include Dolphin Club, Drill Team, Military Parachute Club, Semper Fidelis, Surface Action Group, Astronomy Club, Forensic Society, History Club and International Club.	Recreational ECAs available throughout the four years include archery, photography and scuba. Musical ECAs such as the Drum and Bugle Corps, choirs, Glee Club, Trident Brass, and Drama Club also are offered. Other activities include Log Magazine, Brigade Activities Committee, WRNV Radio and Big Brothers/Big Sisters.	

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Life at the Naval Academy

It would be impossible to predict what four years at the Naval Academy would be like for you personally, but we can describe our philosophy, our curriculum and the daily life you can expect. Only when you experience the exhausting rigors of Plebe Summer, only when you face the responsibility of commanding other midshipmen and only when you throw your hat into the air at graduation will you really know what the Naval Academy experience is all about. We can explain that the four years at Annapolis are tightly structured. While there are many ways you can pursue your individual areas of interest, a four-year program is required of all midshipmen. In this section, we will give you a general description of life at Annapolis. Later chapters give you the details of the academic, athletic and professional training programs.

Definitions

Let's start with a few basics. On your first day at the academy, you begin learning a whole new vocabulary of nautical and Naval Academy terms. Before long, the floor is the deck, the wall is the bulkhead and the restroom is

the head. Likewise, midshipmen seniority is stated in a way different from traditional college terms. We designate our class ranks this way:

Freshman = Fourth class or plebe
Sophomore = Third class or youngster
Junior = Second class
Senior = First class or firstie

All Naval Academy students, men and women, are called midshipmen, which is a rank between chief warrant officer and ensign in the Navy. A midshipman first class is a senior. The student body is the Brigade of Midshipmen, or simply the brigade, and the naval service often is called the fleet. The brigade is divided into six battalions. Six companies make up each battalion, making a total of 36 companies. The midshipmen command structure, headed by a first class midshipman chosen for outstanding leadership performance to be brigade commander, is responsible for much of the brigade's day-to-day activities as well as the professional training of midshipmen. Overseeing all brigade activities is the Commandant of Midshipmen, an active-duty Navy officer of captain's rank or above. Working for the commandant, experienced Navy and Marine Corps officers are assigned as company and battalion officers.

Four-Year Summary

The pull-out chart on this page provides a diagram showing the highlights of the Naval Academy's four-year program. Each year at the academy builds on the learning and experience of the previous year. As you complete basic courses and begin advanced studies, you also take on more responsibility in leading underclassmen at Annapolis and acting as a junior officer during summer professional training with the fleet.

Life in the Brigade

No matter what your background, chances are the living arrangements at the academy are different from anything you have experienced. The day begins with reveille and ends with lights out. You stand watches, march to meals and wear uniforms for almost everything you do. You and your roommates must keep your room ready for a military inspection at any

"You make friendships that will last the rest of your life. When everyone is going through the same challenges, you find a very close-knit group develops."

"Life in the brigade is a unique process of social maturation mixed with leadership experience. Your perspective as a midshipman changes from year to year as you fall into each of the respective roles and then look back at them. When it's all over you've matured a great deal and have had an awful lot of fun, including memories that will stay with you forever."

time and keep your uniforms in regulation condition. Demerits are awarded for a room or uniform that is not in proper order or squared away.

All midshipmen live in Bancroft Hall, a huge dormitory complex. You are assigned to a room with one or more midshipmen and live in close proximity to about 120 other midshipmen in your company. Men and women midshipmen from all four classes make up each company. Each company has its own living area, called the wardroom, for meetings and recreation.

The company is the most important unit of the 4,300-member Brigade of Midshipmen. Many of your most rewarding experiences at the Naval Academy are those you share with members of your company. You eat, sleep, study, drill, play and compete as teams with your company mates. You learn to trust and rely on each other. And you pull together to get through rough times. The company experience also gives you an idea of how things work in the Navy and Marine Corps, where small-unit cohesion, teamwork and morale are as important in peacetime operations as in combat. The year-long color competition among the 36 companies is one way company spirit is built. Companies accumulate points for academic, professional and intramural excellence. The company with the most points is recognized at the Color Parade during Commissioning Week and then enjoys special privileges for the next year, including the honor of representing the Naval Academy at official functions such as presidential inaugurations.

"As a plebe you will learn how to follow, how to think and how to react. As an upperclassman you will learn how to lead, how to teach, and how to motivate."

"As hard as it was, because of all the things I learned and accomplished, plebe summer was one of the greatest experiences of my life."

Plebe Summer

All midshipmen begin the four-year program with Plebe Summer, a period designed to turn civilians into midshipmen. Plebe Summer is no gentle easing into the military routine. Soon after entering the gate on Induction Day, you are put into uniform and taught how to salute by the first class midshipmen and officers who lead the plebe indoctrination program. For the next seven weeks, you start your days at dawn with an hour of rigorous exercise and end them long after sunset, wondering how you will make it through the next day. Forget television, leisure time or movies. You will have barely enough hours in the day to finish your assigned plebe tasks.

The frantic, exhausting pace of Plebe Summer leads you somewhere. It gets you ready for your responsibilities when the brigade returns from summer training and the academic year begins. The summer also builds the foundation for the tangible and intangible qualities that make an outstanding naval officer. You learn self-discipline. You learn to organize your time and decide which things are most important. You reach top physical condition. You develop your ability to think clearly under stress and to react quickly when the unexpected comes your way. Any officer who has stood the watch on the bridge of a ship in a storm or landed a jet on the deck of an aircraft carrier at night can tell you the importance of these qualities.

Plebe Summer introduces you to the basic how-to's of the Navy as well. Aboard Naval Academy sailboats, you learn to respect the power of wind and current. In motor boats and yard patrol craft, you learn the basics of seamanship, navigation and boat handling. On the weapons range, you learn how to fire small arms safely and accurately. You also learn why we have high standards of honor, character and morality. And, you begin to develop your own ideas about leadership and the techniques that will make you an effective leader when your turn comes.

Academic year

When the upperclassmen return to the academy in late August to begin the academic year, you begin a routine that becomes very familiar during your four years. A typical weekday schedule looks something like this:

5:30 a.m.	Arise for personal fitness workout and breakfast
6:30 a.m.	Reveille (all hands out of bed)
6:30 - 7:00 a.m.	Special instruction period for plebes
7:10 a.m.	Breakfast
7:35 a.m.	Personnel formation for muster and inspection
7:55 - 11:45 a.m.	Four class periods, one hour each
12:10 p.m.	Noon meal formation
12:20 p.m.	Noon meal for all midshipmen
1:15 - 3:05 p.m.	Fifth and sixth class periods
3:30 - 6:00 p.m.	Varsity and intramural athletics, extracurricular and personal activities; drill and parades twice weekly in the fall and spring
5:00 - 7:00 p.m.	Supper
7:15 - midnight	Study period for all midshipmen
11:00 p.m.	Lights out for plebes

When you add to this schedule the time required for military duties, inspection preparation and extra academic instruction, you can see the demands on your time are considerable.

Leadership Responsibility

As you progress through the years at the academy, leadership responsibilities grow. Each year, you and your classmates assume more important roles in running your company, your battalion and the brigade. By the time you are a firstclass midshipman, you are making daily decisions affecting the morale and performance of other midshipmen. You are teaching them the fundamentals of the naval profession and helping them through difficulties. You are leading them through personal example, communications, rewards and discipline and other techniques you have learned in the classroom and through three years' experience. Your leadership responsibilities also increase in summer professional training. After learning what it is like to be a sailor aboard ship during youngster cruise, you undertake the duties of a junior officer during your first-class summer assignment.

You build your leadership skills in these and other settings, where you can learn from mistakes and benefit from the guidance of seasoned Navy and Marine Corps officers. By the time you take your position as a naval officer responsible for leading talented sailors and marines, you know what leadership techniques and styles work best for you in different situations.

Religious Activities

The copper-green dome of the Chapel towers over the other buildings in the Yard at the Naval Academy and, in a sense, serves as a symbol of Annapolis to the outside world. This is more than a coincidence. Over the decades of our history, fighting Americans have learned by experience that there is a dimension to military leadership -- both in and out of combat -- that is essential to real effectiveness. This is the spiritual factor, the intangible quality we call moral courage.

Protestant, Catholic and Jewish services, in both traditional and contemporary form, are held each week at the academy. Midshipmen also may attend any of the churches in the community. While attendance at religious services is optional, midshipmen are reminded that as officers of the naval service their personal beliefs will often be tested and that in time of stress their subordinates will look to them for spiritual as well as professional guidance. The Naval Academy has long believed that future officers owe it to themselves and to those they will lead to gain insights into moral, ethical and spiritual dimensions of military leadership. Midshipman are encouraged to take full advantage of opportunities for worship and moral development at the academy. From the first day of Plebe Summer until the day of commissioning four years later, the academy's staff of seven chaplains serves and ministers to the needs of the Brigade of Midshipmen. Among other things, they provide personal counseling ranging from faith-centered issues through crises of life and death to future marriage plans.

In exercising a ministry of "presence" throughout the daily life of the brigade, chaplains sponsor and participate in Bible studies, prayer groups and instruction classes, visit in company areas and are involved in a host of other

"No other place in the world can match the beauty of a night on the Yard or the pride you feel knowing, "this is my school, this is my country."

brigade activities -- all of which are designed to share and build lasting spiritual resources and to cultivate the strength and inspiration that comes from a deeply personal relationship with God.

Recreation

All midshipmen are encouraged to take part in one or more of the academy's many clubs and extracurricular activities. For plebes especially, these activities help to relieve the stress of academics and the tough military routine. After plebe year, your free time increases to relax, pursue personal interests, date and explore the local area. There's much to see and do in Annapolis, Baltimore and Washington, D.C. There also are many cultural, social and sports activities sponsored by the academy.

Spectator sports

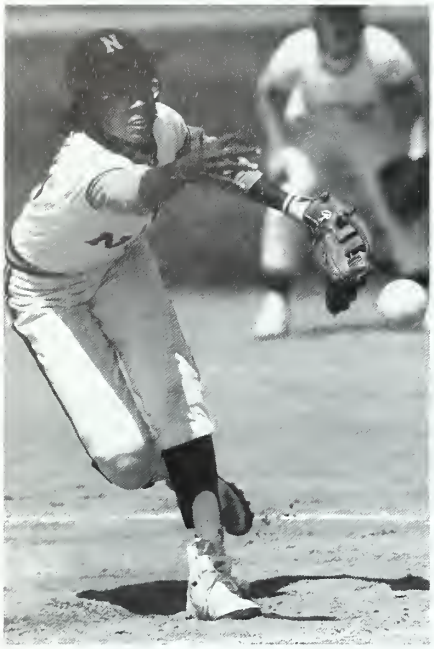
On autumn weekends, the excitement and color of Navy football sweeps the brigade. All midshipmen attend home games in Navy-Marine Corps Memorial Stadium. Groups of midshipmen also attend most away games. The football season ends with the whole brigade cheering on the team in the traditional Army-Navy game. There are 32 other varsity Navy teams to cheer on, as well. Outstanding spectator facilities bring out enthusiastic Navy supporters for almost every rivalry from wrestling and swimming to lacrosse, basketball, soccer and baseball.

Plebe Sponsor Program

During Plebe Summer, every midshipman is introduced to an Annapolis-area family that has volunteered to host midshipmen for dinners, local sightseeing, recreation and simple relaxation away from the demands of the Yard. Many sponsor relationships last long beyond the academy years.

Social events

The Brigade Activities Committee plans several special weekends during the year, including events like the annual International Ball with young guests from embassy row in Washington. Midshipmen groups also plan and participate in theatrical events, concerts and dinners. Senior naval officers join midshipmen regularly for traditional mess nights featuring formal rules of order, formal toasts, skits and fines. Individual companies of midshipmen often organize their own special activities on weekends. Certainly the highlight of our social calendar is Commissioning Week in May -- five days of dances, garden parties, parades, concerts, sailing and a Blue Angels flight demonstration leading to graduation and commissioning of midshipmen first class.



"Outlets of creativity are a necessity."

Cultural Affairs Program

We take advantage of our proximity to Washington, D.C., and Baltimore to arrange tickets and transportation to cultural events in those metropolitan areas. Plays, symphonies, operas and ballets at Washington's Kennedy Center and other theatres are open to midshipmen from all classes.

With the 1991 opening of the Bob Hope Performing Arts Center at Alumni Hall, the Naval Academy is able to provide a wide variety of theatrical and concert events to midshipmen. The Distinguished Artists Series, which presents performers of international renown, is the centerpiece of the program. Masqueraders productions, musicals, Glee Club concerts, Chapel organ recitals, popular music concerts, Naval Academy Band concerts and chamber music recitals round out the action-packed year of events. Many other cultural activities, including poetry readings and lectures by leading American authors, are offered at the academy.

Extracurricular Activities

Even with a midshipman's demanding academic and athletic schedule, you will have time for extracurricular activities (ECAs). We have more than 70 that give midshipmen a chance to share recreational, professional and athletic interests. Most of the ECAs are run by midshipmen.

Musical

Catholic Choir
Protestant Choir
Gospel Choir
Glee Club Musical
Men's and Women's Glee Clubs
Trident Brass
Drum and Bugle Corps

Athletic

Aerobics
Bicycle racing
Boxing
Ice hockey (men)
Judo
Karate
Lacrosse (women)
Powerlifting
Rugby (men)
Soccer (women)
Tennis (women)
Softball (women)

Professional

Airborne Training Unit
Dolphin Club
Foreign Affairs Conference
Midshipmen Aviation Club
Navy Tactical Wargaming
Semper Fidelis
Small Arms Club
Surface Action Group
Women's Professional Association
Yard Patrol Squadron

Recreational

Amateur Radio Club
Archery Club
Computer Club
National Eagle Scout Association
Photography Club
Scuba Club
Sportsman's Club

Academic

Astronomy Club
Chemistry Club
Forensic Society
History Club
International Club
Language clubs
Math Club
Branches of many professional associations and honor societies

Publications

Log magazine
Lucky Bag
Reef Points
Trident Calendar

"ECAs make the academy experience really come to life. You can get so much more out of your four years here if you get involved. ECAs provide great relaxation and great friends."

Brigade support

Brigade Activities Committee
Cheerleaders
Masqueraders
Silent Drill Team
Social Affairs Committee

Religious

Baptist Student Union
Catholic Midshipmen Club
Fellowship of Christian Athletes
Jewish Midshipmen Club
Latter Day Saints Student Association
Navigators
Officers' Christian Fellowship
Protestant Midshipmen Club

Other

Big Brother-Big Sister
Black Studies Club
Cannoneers
Filipino-American Club
Japanese-American Club
Korean-American Club
Latin-American Club
Midshipmen Action Organization
Public Relations Committee
Ring and Crest Committee
WRNV Radio

Local and Area Attractions

The Naval Academy lies adjacent to historic downtown Annapolis, which is famous for its state capitol, colonial homes and waterfront. The city dock is the focal point of the Annapolis waterfront. Workboats outfitted for harvesting crabs and oysters berth next to million-dollar sailing yachts and power boats. During mild weather, the dock is the scene of concerts, boat shows and festivals mixing midshipmen and local citizens with thousands of tourists. For a small city of 35,000, Annapolis is very sophisticated, offering many fine restaurants, boutiques, art galleries, museums, repertory theatre and a symphony orchestra. Several large shopping centers and malls are located in the suburbs.

Maryland's largest city, Baltimore, is approximately 30 miles from Annapolis and the Naval Academy. Baltimore's Inner Harbor offers a wide variety of specialty shops, eateries and entertainment. The Maryland Science Center and the National Aquarium are also there. Greater Baltimore also has theatres, galleries, museums and a zoo. For sports enthusiasts, there are race tracks, a professional indoor soccer team and the Baltimore Orioles baseball team.

Due west of Annapolis lies Washington, D.C., our nation's capital. Washington is home to the Smithsonian Institution with its museums of Natural History, American Art, American History and Air and Space. There are hundreds of other attractions ranging from art galleries, symphonies, opera, ballet and off-Broadway theatre to rock and jazz concerts, ethnic festivals and scenic parks. Washington also has its share of professional sports teams including the Redskins in football, the Bullets in basketball and the Capitals in ice hockey.

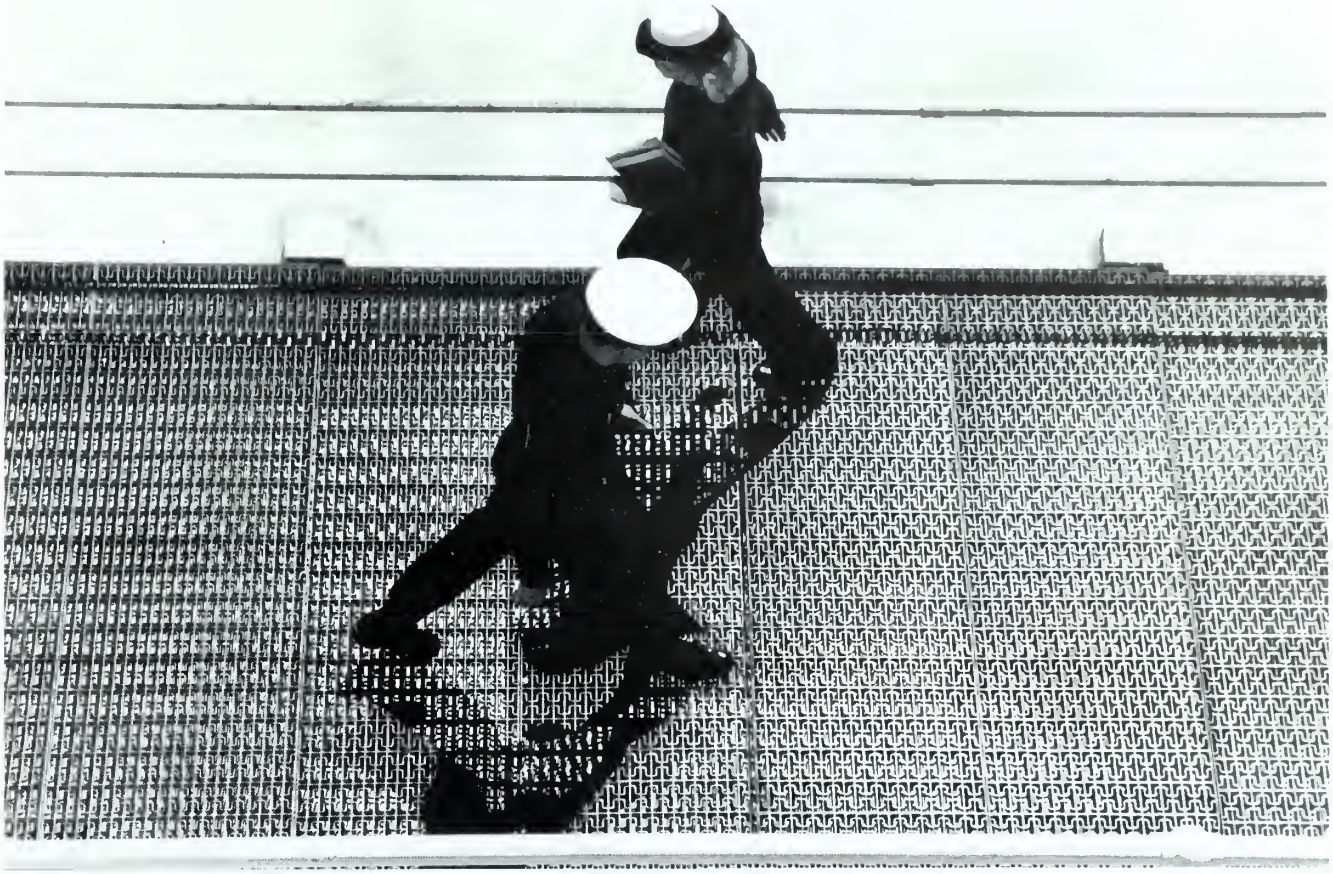
Midshipmen Pay and Benefits

The Navy pays for the tuition, room and board, and medical and dental care of Naval Academy midshipmen. You also enjoy regular active-duty benefits including access to military commissaries and exchanges, commercial transportation and lodging discounts, and the ability to fly space-available in military aircraft around the world. In addition, all midshipmen are paid $543.90 monthly. Part of this goes to defray the cost of uniforms, books and professional equipment.

Leave and Privileges

"You're never alone anywhere in the world if you are a midshipmen; there is always an open door."

The Naval Academy's combined academic, military and physical development programs demand a lot of effort, requiring you to spend more time on campus than the typical civilian college student. But midshipmen enjoy Christmas and summer vacations (leave) plus shorter periods of time off (liberty). Free time to be away from the academy is based in large part on assigned military responsibilities, performance in academic and military endeavors and class seniority. You earn more liberty and privileges each year you advance at the academy. All midshipmen generally are granted leave during these periods:



- Thanksgiving leave;
- a Christmas vacation at the end of the fall semester;
- mid-term leave during spring semester;
- Easter liberty;
- a short break at the end of spring semester and before Commissioning Week; and
- a month-long summer vacation for all but new plebes, staggered according to the summer's professional training schedule.

During semesters of the academic year, off-campus privileges fall into two categories: town liberty and weekend liberty. Weekend liberty permits you to leave the academy after your last class on Friday and return Sunday evening. Liberty curfews differ according to seniority. You are not eligible for liberty if you are assigned a military watch (rotated responsibilities) or if you are having serious difficulty in academics, conduct or military performance. Generally, town and weekend liberty is authorized for midshipmen as follows:

- Plebes have town liberty on Saturday afternoons and evenings and liberty within the Naval Academy complex on Saturday mornings and Sunday afternoons. Plebes can date on at least four weekends during the year and throughout Commissioning Week. Special weekend liberty may be granted on special occasions.
- Five liberty weekends each semester are authorized for third-classmen, eight a semester for second-classmen.

"Don't kid yourself. The academy is very demanding and also very restrictive. Your social life will suffer, but part of that is necessary and part of it is tradition. Either way, if you really want to serve your country as a naval officer I think it is a small sacrifice to make toward that end."

- First-classmen have town liberty all day Saturday, Sunday morning and afternoon, and every afternoon after classes. They also have weekend liberty, in consonance with assigned military watches.

Motor vehicles

Restrictions apply to your use of motor vehicles as a midshipman. This is necessary because parking space is very limited at the academy and in Annapolis. Also, you have limited time off in the first years to make use of a private vehicle. These are the current rules:

- As a plebe you are not permitted to operate motor vehicles except when authorized leave, such as during Christmas vacation.
- Third-class midshipmen may have a car but must maintain and operate it beyond the town liberty limits.
- Second-class midshipmen may have a car but must maintain and operate it at least two miles beyond academy grounds.
- First-class midshipmen may drive a car in Annapolis and on board the Naval Academy and may park at the academy.
- No midshipman is allowed to maintain or operate a motorcycle within town liberty limits.

Alcohol and drugs

As a future naval officer, you learn at the Naval Academy to drink in a responsible way, if at all, and to shun illegal drugs entirely. Normally, plebes are not allowed to consume alcoholic beverages except when on leave away from the academy. As an upperclass midshipman, you may drink if you are the minimum legal age for drinking in the state, 21 in Maryland. The use of illegal drugs is strictly forbidden and results in expulsion from the academy. As a midshipman, you are subject to random drug testing through urinalysis, consistent with Navy-wide policies and procedures.

Services

Almost everything you need as a midshipman is available on the academy grounds. There's a bookstore, uniform and tailor shop, cobbler shop, snack bar, barber shops, post office, recreation rooms and bowling alley. We also provide the following services:

Dining

The entire brigade eats at one time in a massive dining area or wardroom, King Hall. Companies sit together and food is served family-style for breakfast and lunch. Evening meal is a buffet with salad bar. The typical daily diet adds up to about 4,500 calories and includes such dishes as steak, home-baked pastries, homemade ice cream, spiced shrimp, steamed Chesapeake crabs and Mexican cuisine. All of the food for the 15,000 meals served daily is prepared by our food service staff in the kitchens adjacent to King Hall.

Medical and dental care

Modern facilities for medical and dental treatment are located in Bancroft Hall. Besides routine medical treatment and comprehensive dental care, orthopedics/sports medicine, podiatry, physical therapy and optometry services are available. Specialists in internal medicine/cardiology, dermatology and allergies provide care during scheduled visits to the academy. Consultation and treatment in virtually all major medical and

surgical specialties is available at the Naval Hospital, Bethesda, Md. Midshipmen requiring more definitive inpatient care are normally transported to the Naval Hospital, Bethesda. Exceptions to this are hospitalizations for orthopedic procedures and for emergency conditions, which are usually arranged at Anne Arundel General Hospital, a fully accredited civilian facility in Annapolis.

"You have to really want to be here or you won't make it. You know you're ready to make it every night you can turn off the lights and know you gave 110% that day."

Counseling services

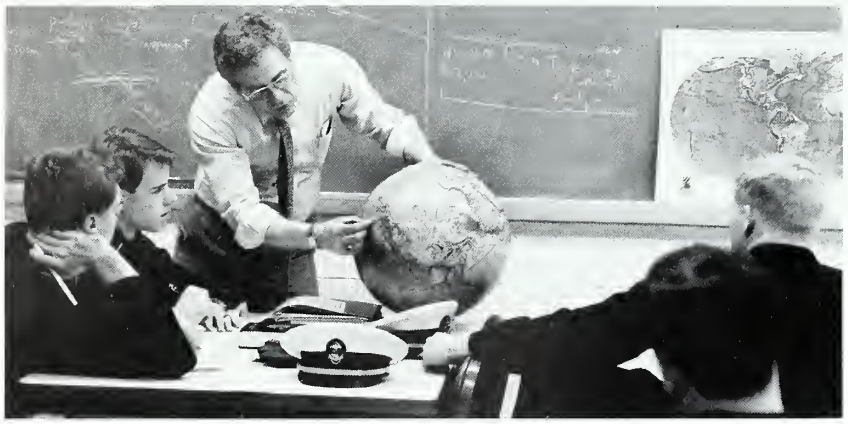
Psychological services are provided in the Academic Center for Counseling and Advising. The center is staffed by psychologists who can help with adjustment, interpersonal and stress-related problems. Progams for Adult Children of Alcoholics, alcohol education and Adults Molested as Children also are available through the center.

Legal assistance

The Office of Legal Counsel is available to assist midshipmen with personal and military legal questions.

Financial advice

Regular seminars offer information on savings, loans, insurance programs and estate planning. Individual financial counseling is available from a Navy supply corps officer who serves as midshipmen financial advisor.



Academic and Professional Education

To prepare midshipmen as naval officers, the Naval Academy's curriculum blends professional subjects with required and elective courses similar to those offered at leading civilian colleges. Our curriculum has three basic elements:

- core requirements in engineering, natural sciences, the humanities and social sciences, assuring that graduates are able to think, solve problems and express conclusions clearly;
- core academic courses and practical training teaching the professional and leadership skills required of Navy and Marine Corps officers; and
- an academic major in a subject chosen by midshipmen to develop their individual interests and talents.

Accreditation

The Naval Academy is accredited by the Middle States Association of Colleges and Secondary Schools. In addition, seven of the Naval Academy's engineering majors are professionally accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board of Engineering and Technology (ABET). The computer science major is accredited by the Computer Science Accreditation Commission (CSAC) of the Computing Sciences Accreditation Board (CSAB), and the chemistry major is accredited by the American Chemical Society.

Degree Awarded

"If you've never been challenged by academics, get ready for a surprise."

Upon graduation, you are awarded a bachelor of science degree, regardless of your major, because of the technical content of the core curriculum. Those in the top 10 percent of their class graduate with distinction. Those who have completed special honors programs in selected majors graduate with honors.

Educational Philosophy

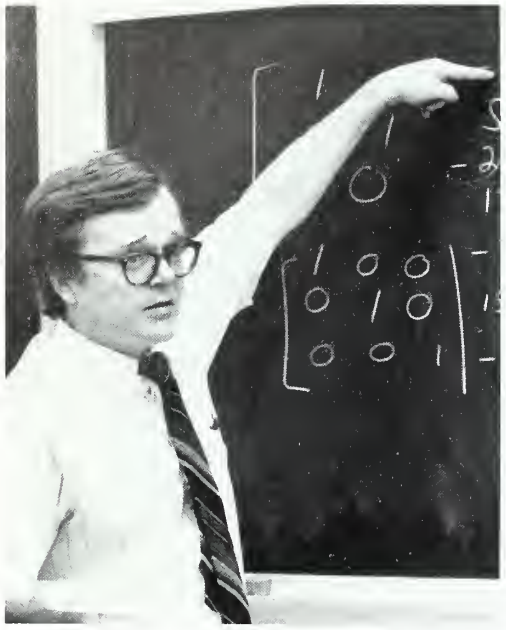
The Naval Academy's philosophy of education stresses individual attention to students by a highly qualified faculty who are strongly committed to teaching. You won't get lost in the classroom at the Naval Academy. Classes are small, generally ranging in size from 10 to 22 students. Even the core courses required of all midshipmen are divided into small sections. You get individual attention from your instructor. In science and engineering courses, the same professor who lectures in the classroom supervises experiments in the lab. This contrasts sharply with most universities, where scholars may address their students in huge lecture halls, but direct contact with undergraduates in labs or discussion sections is delegated to graduate assistants. All courses at the Naval Academy are taught by faculty members, not by graduate assistants.

Dean Robert H. Shapiro reported to the Naval Academy in June 1989 as the fifth academic dean and the first Naval Academy provost; he is the chief academic officer at the academy. During the Korean conflict, he enlisted in the U.S. Navy and served four years as a hospital corpsman in both the Navy and the Marine Corps. In 1961 he received a bachelor of science degree from the University of Connecticut in pharmaceutical chemistry with high honors and distinction and as a university scholar. He earned a Ph.D. in chemistry from Stanford University in 1964. A National Science Foundation fellowship in 1964 allowed him a year of postdoctoral study at the Royal Veterinary and Agricultural College in Copenhagen, Denmark. Dean Shapiro's professional career spanned 15 years at the University of Colorado at Boulder and nearly a decade at James Madison University in Virginia, where he served first as chairman of the chemistry department, five years as dean of the college of letters and sciences and one year as vice president for academic affairs. He was recently inducted as an honorary member of the U.S. Naval Academy Class of 1961, an honor that he cherishes.

"Education is the key to success and leadership. I believe that a good leader is an informed leader, and an informed leader is an educated leader. Midshipmen are given the opportunity to get an academic education and to get an education about proper conduct, military performance, honor and physical fitness. That is what distinguishes the Naval Academy from other civilian universities -- the opportunity for the highest-quality, comprehensive college education.

"The academic program at the academy provides the opportunity for midshipmen to develop self-discipline, self-confidence and conceptual knowledge. Our core curriculum balances technical and non-technical subjects and has received national acclaim for its breadth and its depth. The knowledge base offered by the Naval Academy will give our students many immeasurable attributes of character, the most important of which include self-confidence, the ability to make informed decisions, and to be knowledgeable and compassionate leaders in the Navy and Marine Corps.

"High standards are the hallmark of this academy. We strive to develop a love for learning, a thirst for knowledge and a foundation for imagination. Education is a never-ending process -- no one is ever completely educated; there is always more to learn, always room for continuous improvement of the mind. I believe the Naval Academy is the best place to start on that long journey of learning."



"I think that the core curriculum is good in that no matter what a person's major is, it gives everyone a basic standard level of technical knowledge and problem-solving prowess. I feel that in today's high technology these traits are indispensable."

Faculty

Our 650-member faculty is an integrated group of officers and civilians in nearly equal numbers. This composition is unique among service academies. It dates from the earliest days of the Naval School when three civilian teachers joined four Navy officers in the first faculty. Officers rotate to the academy for two to three year assignments, bringing fresh ideas and experiences from operational units and staffs of the Navy and Marine Corps. They can also explain how studies at the academy are applied in the fleet and the field. The academy's civilian faculty members give continuity to the educational program and form a core of professional scholarship and teaching experience. Nearly all of these civilians have doctoral degrees, and many of them are recognized as leading scholars in their fields. Working together closely, these military and civilian faculty members form one of the strongest and most dedicated teaching faculties of any college or university in the United States. Although many faculty members are involved in scholarly research and writing, their first priority always is teaching.

Academic Advising

Midshipmen receive as much help as they need in planning their curriculum. The academic advising system has two stages. During Plebe Summer each company of plebes is assigned two faculty members, either military or civilian, to act as its advisers. Each plebe receives academic counseling including basic study skills information prior to the commencement of the academic year. Advising continues throughout the year as often as necessary. When a major is selected in the spring of plebe year, midshipmen are assigned a permanent faculty adviser from the academic department of that major. Professors and company officers are extremely helpful in providing academic counseling and advice to midshipmen.

Core Curriculum

In four years at the Naval Academy, you are required to take certain core courses to make sure you are well prepared for the major career-path options available to Navy and Marine Corps officers. Core requirements also prepare you for advanced professional training and postgraduate education, which are expected of nearly all naval officers. Through required courses in engineering, natural sciences, social sciences, the humanities, professional military subjects and physical education, the Naval Academy gives you a balanced education to open practically any door of opportunity in the future.

During plebe or freshman year, nearly all courses are required. An elective course may be taken plebe year. The required courses form the foundation for the more advanced courses chosen by upperclass midshipmen. Some core requirements in the upperclass years have alternative courses from which to choose, depending on your academic background, abilities and major.

The typical academic schedule for plebes includes five courses in each of two semesters:

Plebe year first semester -- 16 credit hours

- Calculus I -- Plebes not adequately prepared for calculus take a pre-calculus course that does not count as part of the minimum mathematics requirement.
- Chemistry -- Including laboratories.

- U.S. Government and Constitutional Development -- Plebes may take an elective and defer this course until later in their programs.
- Leadership I -- Introduction to military leadership principles.
- Rhetoric and Introduction to Literature I -- Some plebes take a practical writing course to prepare for this class.

"No one should be subjected to just one area of study. Here you're forced to be well versed in all aspects of education whether you like it or not."

Plebe year second semester -- 18 credit hours

- Calculus II -- Continuation of the first-semester course.
- Chemistry -- Continuation of the first-semester course.
- American Naval Heritage -- Plebes may take an elective and defer this course until later in their program.
- Fundamentals of Naval Science.
- Rhetoric and Introduction to Literature II.

Advanced Placement

More than half of those entering the Naval Academy validate one or more courses. This validation is attributable to previous college-level achievement. Each of the academy's academic departments sets its own validation standards and considers one or more of the following:

- transcripts.
- department validation tests, administered at the Naval Academy.
- College Entrance Examination Board (CEEB) Achievement and Advanced Placement tests.

If you validate a basic course, you can enroll in a sequential course in the same subject, take care of another curriculum requirement or carry a lighter academic load. In any case, you must take a minimum of 15 credit hours each semester and spend a total of four years in residence at the Naval Academy to complete professional courses and training.

Midshipmen who take advantage of validation in their early years may pursue independent research, honors programs or master's degree studies in their fourth year at the academy, if they qualify for admission to these special programs.

Majors Program

The Naval Academy is, fundamentally, an engineering school, and it is expected that the majority of graduates will be engineers or technical majors. For those exceptional students with unique backgrounds or overriding interests and commitments to other fields of study, a broad majors program in those social sciences and humanities that can be reasonably related to the naval profession is offered.

Near the end of plebe year, you choose a major course of study with the aid and support of academic and military advisers. A total of 18 majors is offered:

Aerospace Engineering
Chemistry
Computer Science
Economics
Electrical Engineering
English
General Engineering
General Science
History
Marine Engineering
Mathematics
Mechanical Engineering
Naval Architecture
Ocean Engineering
Oceanography
Physics
Political Science
Systems Engineering

Some of these areas offer additional specialization within the major. For example, recognizing that the Navy is an important user of space vehicles and satellites, the Naval Academy recently created an astronautics track within the

"Eighteen majors for only 4,300 students is outstanding."

aerospace engineering major to help prepare midshipmen for assignments with the Navy Space Command and NASA.

Minors in French, German, Spanish, Russian and Japanese are offered to those who began to study any of these languages before coming to the academy or who complete requirements while at the academy.

Special Academic Opportunities

Outstanding students at the Naval Academy have many opportunities to challenge and advance themselves through several special programs.

Trident Scholars

Top midshipmen scholars can spend their senior year conducting independent research in an area of interest, working with a faculty adviser who is an expert in the field. Trident Scholars carry a reduced formal course load to give them time for in-depth research and preparation of a thesis. Recent Trident Scholar projects have included research on "The Effects of Processing on the Navy's new 'Stainless Aluminums' " to "Causative Mechanisms for Explosive Cyclone Development over the Atlantic."

Honors program

Midshipmen with excellent academic and leadership performance can apply for honors programs offered in history, English, political science, mathematics, oceanography and economics. Honors students complete a thesis or research project, and orally defend it before a panel of faculty members. Successful participants graduate with honors.

Voluntary Graduate Education Program (VGEP)

Midshipmen who have completed academy course requirements early through any combination of validation and overloading can begin work toward master's degrees at nearby civilian universities such as Georgetown, Johns Hopkins and the University of Maryland. Up to 20 midshipmen can

"I try to go into every course with the same outlook. I want to do well. I try not to separate courses by difficulty."

participate annually, starting graduate work during first-class (senior) year and completing their master's degree programs within seven months after graduation from the Naval Academy. Fields of study are selected from Navy-approved graduate education programs leading to Navy subspecialty qualification.

Facilities

From wind tunnels to a nuclear reactor, we have outstanding facilities and equipment in every phase of our program. Several new academic buildings have opened in recent years, and older classrooms, labs and athletic facilities have been renovated to provide modern and comfortable areas for learning and recreation.

Special academic facilities

- propulsion lab
- wind tunnels, both subsonic and supersonic
- 120-foot and 380-foot towing tanks
- coastal engineering basin
- environmental chamber facilities
- sub-critical nuclear reactor
- oceanographic research vessel, field laboratory and weather station
- 16-inch Cassegrain reflector telescope
- fully-equipped laboratories for chemistry, physics, engineering, oceanography and foreign language courses

"The facilities at the academy are second to none. Where else can you measure the strength of a bar, perform a wind tunnel experiment, and then work on an individual engineering project of your own design, all in one day."

Computers

Computing at the Naval Academy can be found in every academic department and administrative office. The Naval Academy has a goal of training midshipmen to be effective leaders and managers in an information technology-oriented Navy and Marine Corps. This necessitates that midshipmen, faculty and staff have the electronic tools for sophisticated research, synthesis and presentation of information.

The academy's computer resources include:

- a campus-wide data network connecting faculty, students and staff with extensive computing capabilities;
- the primary academic computing mainframe, a dual processor Honeywell DPS 8/62 running the Naval Academy Timesharing System (a derivative of the Dartmouth College Timesharing System) which will support more than 300 simultaneous users;
- state-of-the-art capabilities in computer graphics, computer-aided design and engineering computation used to simulate aircraft and satellite motion, design of 3-D mechanical systems, 3-D animated displays, solid modeling, surface rendering, signal processing, and the design and numerical control manufacturing of ship models;
- interactive video for training in foreign languages;
- computer languages including Ada, Pascal and BASIC;
- an automated Navy Tactical War Gaming center to support the tactical simulations used in the professional and military training of midshipmen;
- an automated library system which allows access to an electronic catalog from remote locations; and
- appropriate computer applications in all academic and professional programs.

All midshipmen are required to purchase a personal desk-top computer during Plebe Summer. After introductory training, the personal computers are used for a variety of courses and other purposes over the four-year program. Paid for through deductions from midshipmen pay, the computer becomes the personal property of each midshipman and is his or hers to keep upon graduation.

Employing the recently installed Naval Academy Data Network, midshipmen can use their personal computers to link into other computers throughout the academy, as well as to outside educational and commercial information sources. Electronic mail allows midshipmen to use their personal computers to communicate with other midshipmen, faculty and parents.

Writing Center

Open to all midshipmen, the Writing Center exists to help those needing extra writing instruction. The Writing Center is staffed by English department faculty members, both civilian and military, who are experts in composition and in working with students to improve their writing skills.

Math Lab

The Math Lab is available to midshipmen unable to meet with their own instructors. Staffed with faculty members of the Mathematics Department, the Math Lab provides assistance in all core mathematics courses to midshipmen without prior appointments throughout the academic day.

Academic Center for Counseling and Advising

All midshipmen have access to the Academic Center, which offers academic advising services, learning skills classes and psychological counseling. Students who encounter academic difficulty during plebe year are referred to the Academic Center where they receive special academic advising, academic effectiveness classes and tutoring. A series of learning skills classes including topics such as time management, note taking, effective reading, test taking and

"If you want to be a naval officer this is the place to be."

how to cope with stress are offered several times a year for interested midshipmen. The Academic Center coordinates the Plebe Advising Program where faculty members serve as the advisors for a company of plebes during both plebe summer and academic year.

Nimitz Library

Built in 1973, our library offers more than half a million volumes, with a special emphasis on naval science and history. Comfortable reading and study areas can accommodate 1,500 students. The library also contains seminar and group-study rooms, audio and video carrels and a computer terminal room. Through Nimitz Library, midshipmen have access to other libraries in the Washington and Baltimore areas.

Resources afloat

The fundamentals of seamanship, navigation and naval operations are taught in laboratories afloat on our many sail and power craft. The Robert Crown Sailing Center on the Severn River supports many of these activities, as well as recreational and intercollegiate sailing. The Naval Academy's large and varied fleet includes:

- twenty 108-foot yard patrol craft;
- ninety sailboards;
- ninety Lasers;
- thirty 420 dinghies;
- twenty FJ dinghies;
- three Tech dinghies;
- thirty 24-foot Rainbow-class knockabouts;
- twelve J-24s;
- twenty 44-foot sloops; and
- twelve 40- to 60-foot offshore sail training craft.

The Naval Academy's sailing program is truly comprehensive. It ranges from basic instruction to advanced intercollegiate dinghy and international-level, open-ocean racing. Each midshipman participates in sailing during Plebe Summer in 24-foot knockabouts, Lasers and 44-foot sloops.

After Plebe Summer, midshipmen may take part in advanced training under sail, recreational or competitive sailing. Both the Naval Academy's varsity sailing programs, intercollegiate dinghy and off-shore/ocean racing "big boat" are consistently top-ranked nationally.

"Where else are 21-year-old people put in charge of as many as 30 people and expected to mold them into functioning military professionals?"

Professional Courses and Training

Professional courses and training are an important part of the Naval Academy's integrated program. Required courses in such areas as naval science, engineering, navigation and weapons systems give you a working knowledge of modern naval operations and technology. Courses in leadership and military law help prepare you for leadership responsibilities as an upperclass midshipman and a naval officer. Physical education teaches you the value of physical fitness and how to stay fit for life. Eight weeks of annual summer training introduces you to operational units of the Navy and Marine Corps, the life of a sailor and the responsibilities of a junior officer.

Courses available as electives include air navigation, advanced surface and submarine navigation, leadership and psychology. Also available are extracurricular programs such as the Yard Patrol Craft Squadron and the Naval Academy Flight Training Squadron offering advanced, hands-on experience in professional areas.

Academic year courses and training

Fourth-Class (Plebe) Year

Professional courses -- two required introductory classes in naval science and leadership. Courses include classroom studies and lab sessions in operational trainers and afloat in yard patrol craft.

Infantry drill -- about 13 hours of infantry drill in the fall and spring, including four hours in Brigade of Midshipmen dress parades.

Physical education -- the Physical Education Department is tasked with accomplishing one third of the mission of the Naval Academy, to prepare midshipmen physically to become professional Navy and Marine Corps officers. This mission is accomplished through a thorough and rigorous course of instruction in the fundamentals of swimming, personal defense and recreational sports, and through the regular administration of three fitness tests. Midshipmen must meet physical education requirements during their four years at the Naval Academy in order to graduate. The following is required for plebes:

- Swimming -- 100-meter crawl stroke; 50 meters using the sidestroke and elementary backstroke (seven to 11 strokes per 25 meters); tower jump (5, 7.5 or 10 meters)
- Boxing (men only) -- box two one-minute rounds exhibiting proper form, offensive and defensive techniques, fortitude and ringcraft.
- Wrestling (men only) -- wrestle three one-minute periods exhibiting a variety of take-downs, rides, pins and escapes while displaying aggressiveness and a coherent combative strategy.

"Get in shape before you get here."

- Fencing (women only) -- fence one three-minute period exhibiting proper form, offensive and defensive technique, fortitude and poise.
- Gymnastics -- perform standard exercises on the high bar, parallel bars, side horse, vault, balance beam, uneven bars, tumbling and trampoline.
- Self defense (women only) -- perform a variety of kicks, throws, falls, punches, blocks and exhibit proper technique and aggressiveness.

Third-class year

Professional courses -- two required in navigation and naval engineering.

Infantry drill -- about 13 hours in the fall and spring, including dress parades.

Physical Education

- Swimming -- 200-meter swim in a maximum time of 5:12 (five minutes, 12 seconds); 50-meter breaststroke (seven to 11 strokes per 25 meters); 10-meter tower jump; clothing inflation in three minutes; 50-foot underwater swim fully clothed.
- Boxing (men only) -- box two one-minute rounds exhibiting proper form, offensive and defensive techniques, fortitude and ringcraft.
- Combative grappling (women only) -- midshipmen are awarded grades based on take-downs, rides, pins, escapes, aggressiveness and combat strategy.

Second-class year

Professional courses -- five are required, including advanced courses in navigation, naval engineering and weapons. Also required are naval electricity and electronics and a leadership course emphasizing management techniques, problem-solving and decision making.

Infantry drill -- about 13 hours in the fall and spring, including dress parades.

Physical education

- Swimming -- 400-meter swim, maximum time 11 minutes; life-saving (20-meter cross-chest carry, 20-meter wrist carry, 20-meter tired swimmer carry, front strangle-hold escape, rear strangle-hold escape, 3.5-meter tower jump and underwater swim).

"The body is a machine to be worked and pushed to excellence."

First-class year

Professional courses -- the three required are a weapons course exploring warfare systems design, a law course covering military justice and the law of war, and a junior officer course.

Infantry drill -- leading the brigade in about 13 hours of drill, including dress parades.

Physical education

- Swimming -- tower jump (5, 7.5 or 10 meters); swim one-half to one mile in 40 minutes while fully clothed; clothing inflation in two minutes.

In addition to the above requirements all midshipmen are required to pass three fitness tests each semester. Indicated below are the minimum standards for each of these tests.

1.5-mile run -- maximum time for men 10:30; maximum time for women 12:20.

Obstacle Course -- 490-yard /13-obstacle course; maximum time for men 3:05; maximum time for women 3:50.

Applied Strength (Pullups, Situps and Standing Long Jump)

	MEN			WOMEN	
	Pullups	Sit Ups	Long Jump	Sit Ups	Long Jump
First class	6	63	75	63	63
Second class	5	62	74	62	62
Third class	4	61	73	61	61
Fourth class	3	60	72	60	60

Women must perform a minimum of one pullup or 20 seconds flexed-arm hang.

Electives are offered in several sports. Tests in applied strength, one-and-a-half-mile run and obstacle course are administered each semester. Swimming is graded each year.

Summer courses and training

Plebe Summer

This starts on Induction Day early in July. Areas of emphasis include military indoctrination, physical education, basic seamanship and sailing, small arms training, first aid and introduction to personal computers. See page 36 for more on Plebe Summer.

Third-class summer

In the summer between your plebe and third-class years, you will either conduct Atlantic patrols in Yard Patrol craft or sail up and down the eastern seaboard on USNA training sloops. Additionally, you will spend four weeks training with the U.S. Marine Corps, experiencing the ultimate test of teamwork while conducting field exercises.

Second-class summer

During the summer before your second-class year, you are introduced to every major branch of the Navy. In one action-packed summer, you fly Navy aircraft at Pensacola and dive in a nuclear powered submarine off the coast of Florida. You and your classmates will also report to Navy ships and submarines around the world for second class cruise. You become part of the crew for four weeks, taking part in gunnery exercises and drills and standing watches underway. This experience gives you first-hand knowledge of the daily routine of a Navy ship at sea. You also learn to appreciate the talents, responsibilities and perspectives of the enlisted men and women you will later lead as an officer.

First-class summer

In the final summer, you get the chance to put your leadership skills to the test, both in the fleet and at the academy. For eight weeks, you join a Navy or Marine Corps operational unit, and this time your duties are those of a junior officer. Depending on your career interests and qualifications, you can choose a surface warship, submarine, aircraft carrier, or land-based maritime aircraft patrol squadron. Those midshipmen interested in choosing the Marine Corps

"Youngster cruise preps you for a career in the Navy. A Naval Academy diploma preps you for life."

"One must realize that it is imperative for a leader to know how to be a follower first. This is one purpose of plebe summer."

after graduation may attend a "Bulldog" four-week officer candidate course in Quantico, Va., with a follow-on three-week tour attached to a Marine unit.

Other summer training opportunities

To complement these summer training programs, the academy offers the opportunity to qualified midshipmen to attend several different warfare schools: airborne school (parachute jumping) in Georgia, SEAL training (special warfare) in California, scuba school in Florida, or survival evasion, resistance, escape (SERE) training in Colorado.

The academy also offers summer school. Midshipmen may enroll in concentrated versions of regular classes to make up for previous unsatisfactory performance or to get ahead in curricular requirements.

Grading

Grades have extra importance at the Naval Academy because they affect your status and privileges as a midshipman. As the major determinant of class rank, they also determine your priority in service selection and seniority upon graduation and commissioning.

We use a letter grading system with these values, called quality point equivalents, or QPE:

A = 4.0 (Excellent)
B = 3.0 (Good)
C = 2.0 (Satisfactory)
D = 1.0 (Maginally passing)
F = 0.0 (Failing)

Grades are averaged using a weighted semester hour system called the quality point rating or QPR. Your QPR is figured by multiplying the QPE received in each course by the semester hours of credit for the course. That total is divided by the total number of hours completed in the semester. You earn semester QPRs and a cumulative QPR (CQPR) based on all of your grades.

"It's true what is said about coming from being a big fish in a little pond to becoming an average fish in a big pond. Everyone here is a former number one, but if you have what it takes, you adapt and excel anyway."

Midshipmen must maintain a cumulative QPR of 2.0 or above or they risk academic probation or dismissal. As required by law, the Academic Board interviews academically deficient midshipmen. Midshipmen subject to academic discharge are those who fail two or more courses; have a semester QPR below 1.5; fail to remove academic probation; are two or more courses behind in the matrix of the assigned major; do not fulfill a requirement previously assigned by the academic board; or do not complete all graduation requirements by the end of the first-class year.

Grades in military performance, conduct, the physical education and summer professional training are not included in QPR, but they are figured into class standing. Satisfactory performance in professional areas is required.

Academic Recognition

Three honor categories recognize midshipmen with outstanding academic and professional records:

Superintendent's List -- midshipmen with semester QPR of at least 3.4 and no grade below C; grades of A in military performance, conduct and physical education.

Dean's List -- midshipmen with semester QPR of 3.4 and no failure in any academic course; grades of at least C in military performance, conduct and physical education.

Commandant's List -- midshipmen with semester QPR of at least 2.9, grades of at least B in military performance, A in conduct and B in physical education.

Honor societies

A number of national scholastic honor societies are represented at the Naval Academy. Midshipmen who excel academically may be recommended for membership in these societies:

Omicron Delta Epsilon -- international honor society for economics. Midshipmen candidates for election to the Naval Academy chapter need not be economics majors but must have an overall scholastic average of B and at least twelve credits in economics with a B average or better.

Phi Alpha Theta -- international honor society for history. Membership includes both faculty and students who participate in forums, seminars, guest speakers and regional meetings of the society.

Phi Kappa Phi -- for superior scholarship in all fields of study. Up to six percent of the midshipmen of each class may be chosen to join, half during their second-class year and half in first-class year.

Pi Sigma Alpha -- national honor society for political science. To be eligible for membership, midshipmen must stand in the upper one-third of their class with a B or better average in at least 15 hours of political science courses.

Phi Sigma Iota -- international honor society for foreign languages. To be eligible for membership, midshipmen must have an overall B average, a B average in foreign language courses and have completed advanced courses in foreign languages.

Pi Tau Sigma -- national mechanical engineering honor society. Midshipmen majoring in mechanical engineering who stand in the upper third of their class as seniors or the upper fifth as juniors are eligible for membership.

Sigma Pi Sigma -- physics honor society, affiliated with the American Institute of Physics and the American Association for the Advancement of Science. Midshipmen candidates for membership must have completed three semesters of physics with at least a B average and must be in the upper one-third of their class in general scholarship.

Sigma Tau Delta -- national English honor society. To be eligible for membership, midshipmen must be in the upper third of their class with at least a B average in advanced English courses.

Sigma Xi -- scientific research society that encourages original investigation in the fields of pure and applied science. The Naval Academy chapter includes members from the professional staffs of the academy and the Annapolis laboratory of the David Taylor Research Center.

Tau Beta Pi -- national engineering honor society. The top fifth of senior engineering majors and top eighth of junior engineering majors are eligible for membership.

"I'm looking at unlimited possibilities."

Graduation Requirements

To be eligible to graduate, you must:

- complete at least 139 academic credit hours, including core requirements in engineering, natural sciences, humanities and social sciences;
- complete the courses required in your chosen major;
- achieve a final cumulative quality point rating (CQPR) of at least 2.0, a C average;
- meet required standards in professional studies and at-sea training;
- meet required standards of military performance, conduct, honor and physical education; and
- accept a commission in the Navy or Marine Corps, unless one is not offered due to physical disqualification.

Awards

Outstanding midshipmen are recognized publicly during Commissioning Week. A number of organizations and individuals sponsor more than 80 prizes and awards honoring midshipmen for excellence in academics, professional studies, leadership, athletics, sailing, debate and public speaking.

Advanced Education

Postgraduate education is encouraged for all naval officers and is practically a requirement in today's Navy and Marine Corps, which operate very sophisticated systems in a complex world. Nearly all graduates go to advanced professional training en route to their first duty assignments. New Marine officers go to the basic school at Quantico, Va. Navy ensigns go to surface warfare officer school, nuclear power school, flight training or other schools, depending on their chosen specialty and the nature of their first assignment. Professional training then continues throughout your career.

There also are several ways for Naval Academy graduates to earn advanced academic degrees besides the Voluntary Graduate Education Program (VGEP) discussed on page 53. Most officers are automatically considered for graduate school as they complete their first duty assignment. If selected, they can enter master's degree programs at the Naval Postgraduate School in Monterey, Calif., or at an approved civilian university.

"The career opportunities are unlimited upon graduation, but it all depends on you."

"All colleges are what you make of them and are basically the same ... but the academy is truly different."

Midshipmen with outstanding academic records can compete for a number of scholarships for postgraduate school right after graduation from the Naval Academy or after an initial operational assignment. There's also a program for up to 15 graduates a year who want to combine careers in medicine and the Navy. To prepare for this program, midshipmen usually major in chemistry and then enter civilian or armed forces medical schools soon after graduation and commissioning.

Among the graduate education programs available:

Navy Burke Program (Junior Line Officer Advanced Educational Program) -- open to 15 qualified graduates in each class for study toward a master's degree in science or engineering. These studies, usually at the Naval Postgraduate School, begin after one operational tour of two to four years.

Marine Corps Burke Program -- open to 10 graduates from each class who enter the Marine Corps. Graduate study begins approximately two years after commissioning. Selectees may choose their field of study from an extensive list of disciplines.

Oceanography Joint Master's Degree Program -- one midshipman from each Naval Academy graduating class may be selected for a graduate program in oceanography at the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution. This 27-month program leads to a master of science degree in oceanography and a Navy warfare specialty designation in oceanography.

Olmsted Foundation Scholarships -- established by the George and Carol Olmsted Foundation in cooperation with the Department of Defense, these scholarships support two years of graduate education at foreign universities, using foreign languages, for Navy and Marine Corps officers. Two Naval Academy graduates who have served between two and seven years of active duty are eligible each year.

William H.G. FitzGerald Scholarship -- supports two years of graduate study at Oxford University in England for one Naval Academy graduate each year.

Thomas Pownall Scholarship -- supports two years of graduate study at Cambridge University in England for one Naval Academy graduate each year.

Captain Marshall H. Cox Fund -- supports summer travel and language study abroad by midshipmen and newly commissioned Naval Academy graduates. Programs are offered in Russian, Japanese, Spanish, French and German.

Naval Academy graduates may qualify for a number of other scholarships and fellowships awarded for study at civilian colleges and universities. These graduate studies can be pursued in various fields while graduates receive pay as commissioned Navy and Marine Corps officers. Up to 10 members of each class can begin postgraduate studies under these scholarships immediately after graduating from the Naval Academy. Such scholarships include:

Rhodes and Marshall Scholarships for two or three years of graduate study in any field leading to a master of arts or master of philosophy degree -- at Oxford for the Rhodes Scholarship or at any university in Great Britain for the Marshall Scholarship -- with all expenses provided for study and travel. Thirty midshipmen have won the Rhodes Scholarship since 1930, when Navy participation began. There have been six Marshall Scholars from the Naval Academy since 1981.

Truman Scholarship for graduate study in any major, with emphasis on public service. Up to four midshipmen are nominated during their junior year.

Guggenheim Fellowship (Daniel and Florence Guggenheim Foundation) for graduate study at one of three major centers for research and development in rocket propulsion, space flight and space flight structures.

Hertz Fellowship (Fannie and John Hertz Foundation) for graduate study in the applied physical sciences at a choice of 20 universities.

National Science Foundation (NSF) Fellowship leading to a master of science or master of arts degree in the mathematical, physical, biological, engineering, and social sciences and in the history and philosophy of science.

Draper Laboratory Fellowships for graduate study in technical majors at Massachusetts Institute of Technology.

Other scholarships in computer science, marine engineering, mechanical engineering, naval architecture, nuclear engineering, ocean acoustics, oceanography and other areas.

"Every day I try to fit 25 hours in a 24-hour day, but finally when I accomplish everything that needs to be done for the day I can go to bed physically and mentally drained yet satisfied knowing that I achieved my goal."

Division of Engineering and Weapons

Department of Aerospace Engineering
Department of Electrical Engineering
Department of Mechanical Engineering
Department of Naval Systems Engineering
Department of Weapons and Systems Engineering

Department of Aerospace Engineering

Aerospace Engineering Major

The aerospace engineering department offers one of the most exciting and challenging academic programs at the Naval Academy. The program is structured to produce naval officers who will serve in the forefront of the inception, development and employment of Navy air and space assets. The curriculum provides a background in engineering fundamentals through courses in chemistry, physics, mathematics, engineering mechanics, thermodynamics and electrical engineering. With these subjects as a base, students undertake aerospace engineering topics including aerodynamics, propulsion and aerospace structures. The major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

In the area of aeronautics, students extend their study of aerodynamics, flight structures and flight mechanics. The astronautics track allows students to study astrodynamics, satellite attitude dynamics and control, and the space environment. Both tracks conclude with a design course, which allows midshipmen to apply their engineering knowledge to the design of an aero or space flight vehicle. Both tracks also involve thorough laboratory experimentation. The Naval Academy's aerospace laboratory facilities are some of the most advanced and extensive in the country. These facilities include structures, propulsion and rotor labs; variable stability aircraft simulator; spacecraft tracking and experimentation facilities; and various wind tunnels with flow velocities ranging from subsonic to supersonic.

The aerospace engineering major is not required for midshipmen who just want to fly. The Naval Academy prepares all midshipmen to become professional officers in the naval service and upon commissioning they can choose from exciting careers in the aviation, surface or subsurface communities, or service in the Marine Corps.

Graduates from the aerospace engineering major are also fully prepared to undertake postgraduate education programs in engineering disciplines either at the Naval Postgraduate

School or any other academic institution. Naval officers with advanced degrees in the aero/space areas may be assigned to billets involved with the research, development, test and evaluation of Navy aircraft or spacecraft projects. Locations for these challenging technical billets include the Naval Air Systems Command, Naval Research Laboratory, Test Pilot School, the Navy's Space Command, the Unified Space Command, the Navy Space Support Activity and perhaps as a naval astronaut with the National Aeronautics and Space Administration.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM212, SM221;
Science: SP211, SP212;
Humanities: HH205, HH206, FE210;
Engineering: EE331, EE332, EM211, EM214, EM217, EM232, EM319, ES300, ES410;
Major: Aeronautics Track - EA202, EA301, EA303, EA304, EA322, EA330, EA401, EA413, EA440 plus three major electives; Astronautics Track - EA202, EA305, EA322, EA361, EA362, EA365, EA461, EA463, EA464, EA470, plus two major electives; one free elective.

Aerospace Engineering Courses

EA202 Principles of Flight (2-2-3). Gives a broad overview of aerospace engineering. Topics covered include history of flight, the earth's atmosphere, fluid statics, introductions to fluid dynamics, aerodynamics, and the performance of flight vehicles. *Prereq: SM102 or SM112 or SM162.*

EA301 Aerodynamics (3-0-3). Covers essentials of fluid mechanics and topics in aerodynamics including potential flow and thin airfoil theory. *Prereq: EA202.*

EA303 Wind Tunnel (1-2-2). A laboratory course in wind tunnel test techniques. *Coreq: EA301.*

EA304 Aerodynamics II (3-0-3). Discussion of lifting surface theories. Introduction to viscous flow and boundary layer. External compressible flow concepts; Mach and shockwaves, small perturbation and linearized flow methods are introduced. *Prereq: EA301.*

EA322 Aerospace Structures I (2-2-3). Applications of statics and solid mechanics to the design of atmospheric and space flight vehicle structures. Topics include determinate and indeterminate space structures, generalized bending and energy methods to determine shear flows, shear centers and deflections for determinate and indeterminate semimonocoque structures. *Prereq: EM217.*

EA330 Propulsion I (2-2-3). Basic one-dimensional compressible flow including thermodynamics of perfect and real gases in subsonic and supersonic flows. The principles of fluid dynamics and thermodynamics are specialized to the problem of propulsion of aircraft and space vehicles. Cycle analysis, ramjets, jet engines, rockets and propellers. The role of engine components is covered. Numerous laboratory experiments demonstrate the principles involved. *Prereq: EM319, EA301 or EM324.*

EA401 Applied Aero and Design (3-0-3). The basic principles for lift and drag calculations are extended to entire flight vehicle analysis. Static and dynamic point performance analysis. Introduction to energy methods with selected optimum climb and trajectory problems. Mission analysis and carpet plots leading to design selection criteria. *Prereq: EA304, Coreq: EA330.*

EA413 Stability and Control (3-0-3). The aerodynamic and inertial forces and moments acting on the flight vehicle and its component parts are analyzed to determine their effect on static and dynamic stability. *Prereq: EA301.*

EA421 Aerospace Structures II (3-0-3). Introduction to the finite element methods of structural analysis as applied to atmospheric flight and space flight vehicles. Topics include formulation of the element stiffness matrices, assembly of the global structural matrix, formulation of equivalent loads, energy methods and matrix equation solution methods. A design project using a finite element computer program is carried out. *Prereq: EA322.*

EA424 Structural Dynamics (3-0-3). An introductory course in structural dynamics as applied to atmospheric flight and space flight vehicles. Topics include the analysis of free, damped and forced vibrations of single and multi-degrees of freedom systems, continuum vibrations of strings, beams and rectangular plates, matrix formulation of equations of motion, introduction to the finite element method of structural dynamic analysis. *Prereq: EA322.*

EA425 Viscous Flow (3-0-3). An advanced course covering viscous flow problems including laminar, turbulent, incompressible and compressible boundary layers with heat transfer. *Prereq: EA304.*

EA426 Aeroelasticity (3-0-3). An advanced course covering structural mechanics, stability criteria and vibrations. Unsteady two- and three-dimensional incompressible, subsonic, transonic and supersonic aerodynamics. Flutter analysis and influence coefficient method are covered. *Prereq: EA322.*

EA427 Aerodynamics III (3-0-3). An advanced course continuing the study of compressible high-speed flow including general conservation laws for inviscid flows, unsteady flow problems, numerical techniques for supersonic flows, and real gas effects. *Prereq: EA304.*

EA428 Computational Aerodynamics (3-0-3). Introduction to the major numerical techniques used in computational aerodynamics. Topics include mathematical methods, boundary conditions, stability, panel methods, lattice methods, nonlinear problems, time dependent solutions and transonic flow problems. *Prereq: EA304.*

EA430 Propulsion II (3-0-3). The second propulsion course covers turbomachinery theory including compressors, turbines, pumps, application and design methods. Combustion and cooling techniques in modern engines are introduced. *Prereq: EA330.*

EA435 The Aerodynamics of V/STOL Aircraft (3-0-3). An advanced course covering the aerodynamics of vertical and short takeoff and landing aircraft, including fixed wing and rotary wing types, with major emphasis on the helicopter. *Prereq: EA304.*

EA439 Special Design (1-4-3). This course, along with EA440 or EA470, provides a two semester sequence in aerospace design for selected midshipmen. *Prereq: 1/C standing in aerospace engineering.*

EA440 Aerospace Vehicle Design (1-4-3). Preliminary design of a flight vehicle. Includes preliminary layout, weight and balance estimates, performance analysis, stability analysis and structural analysis. *Prereq: 1/C standing in aerospace engineering.*

EA450 Computer-Aided Design in Engineering (2-2-3). Introduction to the engineering design process as well as its computer adaptation. Capabilities and utilization of digital computers and CRT computer graphics are discussed. *Prereq: 2/C or 1/C standing in ABET engineering curriculum, consent of instructor.*

EA482 Aerospace Seminar (1-0-1). A series of discussions or lectures on special or current aerospace engineering topics. *Prereq: 1/C standing in aerospace engineering.*

Astronautics Courses

EA361 Introduction to Space (1-2-2). This introductory course is designed to give an overall perspective of space systems and their uses. Topics include history of space flight, orbital operations, launch platforms and facilities, space environment, and a study of existing and proposed systems and their applications. Laboratory techniques and engineering reporting procedures are introduced. *Prereq: SM102 or SM112 or SM162.*

EA362 Astrodynamics I (3-0-3). Development of the classical two-body problem. Topics include orbital parameters, insertion, orbit determination and maneuvers, types of orbits and their uses, transfer orbits, rendezvous, and interplanetary transfer with hyperbolic passage. *Prereq: EM232, SM212.*

EA461 Space Environment (3-0-3). Introduction to the environment of the upper atmosphere, near earth space, and interplanetary space. Topics include properties of the upper atmosphere and ionosphere, the magnetic field, radiation belts and magnetosphere of earth, the solar wind and interplanetary medium, remote sensing of the atmosphere and oceans, environmental effects on astronauts and spacecraft systems. *Prereq: SP212.*

EA462 Astrodynamics II (3-0-3). Advanced topics in astrodynamics including potential of an arbitrary body and of the earth, orbit determination from observations including numerical techniques for data smoothing, special and general perturbations of orbits and interplanetary trajectories, drag effects on low altitude orbits. Special projects. *Prereq: EA362.*

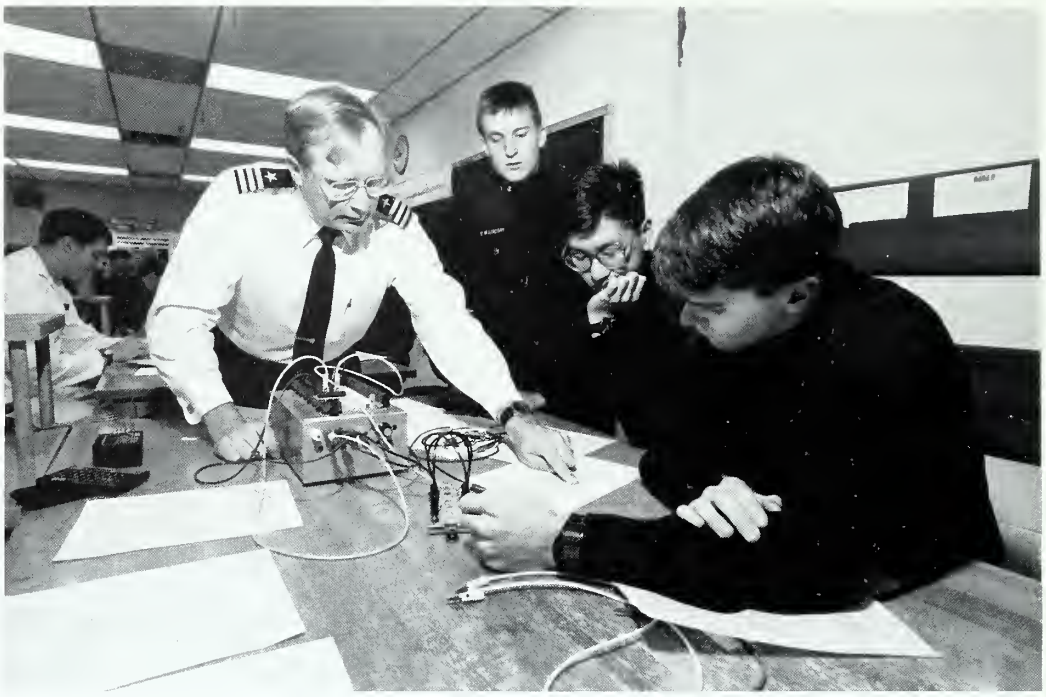
EA463 Spacecraft Systems (3-0-3). Analysis and design of the major system elements that are an integral part of space systems. These include payload, ground control and power, attitude control, detection, tele-communications, propulsion and thermal control systems. Constraints imposed on the system designer by the system application, launch

vehicle and space environments are considered. *Prereq: EE331; Coreq: EA461.*

EA464 Spacecraft Attitude Dynamics and Control (3-0-3). Rigid body dynamics and control of spacecraft. Euler angles, inertial properties of rigid bodies, body-centered equations of motion, torque-free motion. Passive, active, and semi-active attitude controls. Linear feedback control theory and linear estimation. *Prereq: EM232.*

EA466 Spacecraft Thermal Control (3-0-3). This advanced course covers the energy management of a spacecraft. Heat loads from external and internal sources. Heat transfer principles: radiation, conduction and convection. Heat transfer equipment, insulators. Systems consideration including radiator design and optimization. *Prereq: EM319.*

EA470 Spacecraft Design (1-4-3). The preliminary design of a spacecraft vehicle is carried out. The vehicle to be designed must meet specific mission objectives, with consideration to unique design requirements and constraints imposed on the vehicle by outside factors such as the space environment and the launch evolution, etc. Special attention is paid to the methodology used in the design process. *Prereq: 1/C standing in aerospace engineering.*



Department of Electrical Engineering

Electrical Engineering Major

The electrical engineering department offers one of the cornerstone disciplines that will shape the Navy well into the future. The major offers a solid grounding in the fundamental concepts of electrical engineering, as well as the opportunity to specialize in digital computer systems, communication systems, microwave systems and solid state design. The Navy needs engineers trained in these concepts to lead in the development of the Integrated Electric Drive System for ships and microelectronics, the foundation of all future electronic systems. The electrical engineering major is accredited by the Accreditation Board for Engineering and Technology, with a bachelor of science degree in electrical engineering awarded.

The student actively pursues application of classroom concepts in the laboratory. The department has extensive laboratories in fiber optics, microwave theory with radar applications, design and development of solid state devices (transistors), digital and analog communications, integration of digital hardware and software, energy conversion and electrical engineering design. The electrical engineering department is constantly updating all laboratories with leading edge technology.

Two midshipmen per year receive the Steinmetz Prize for innovative work in the electrical engineering design laboratory. The Captain Boyd R. Alexander Prize in electrical engineering is presented during Commissioning Week to the outstanding graduate of the electrical engineering major.

In addition to being well prepared for entry in any job in the naval service, graduates of the electrical engineering major are well prepared to undertake advanced degrees at the Naval Postgraduate School or any other academic institution.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM221, SM212, SM312;
Science: SP221, SP222, SP226, SP342;
Humanities: HH205, HH206 and two elective courses;
Engineering: EM318, EM319, ES300, ES400;
Major: EE221, EE232, EE322, EE421, EE423, EE341, EE342, EE362, plus three major electives; one free elective.

Electrical Engineering Courses

EE221 Introduction to Electrical Engineering (3-2-4). Terminal characteristics of passive linear and nonlinear devices and energy sources are introduced. The steady-state response of network combinations of these devices is studied. The transient response of first-order circuits is studied. Network theorems and the concept of equivalence are studied in detail. The personal computer is employed throughout the course as a tool in support of concept development. *Prereq: SM121 or SM161.*

EE232 Circuit Analysis I (3-0-3). Various fundamental concepts of circuit theory are addressed, including the behavior of second-order circuits; various concepts of power; coupled coils; signal representation in the frequency domain, including complex frequency, Fourier series and transform; and Laplace transform. The personal computer is employed throughout the course as a tool in support of concept development. *Prereq: EE221.*

EE311 Electrical Fundamentals and Applications I (3-2-4). Provides an understanding of the terminal characteristics of circuit building blocks. The basic techniques of circuit analysis using these building blocks to model real devices are presented. The course finishes with the principles of operation and analysis techniques applied to transformers. *Prereq: SP212.*

EE312 Electrical Fundamentals and Applications II (3-2-4). A continuation of the application of modeling and analysis to electric machinery and practical electronic devices such as transistors and diodes. Covered are basic amplifiers, frequency response characteristics and use of these devices as switches. Basic principles of digital logic circuitry are also introduced. This course also covers the theory of AM and FM modulation from the viewpoint of naval systems applications. *Prereq: EE311.*

EE313 Logic Design and Microprocessors (3-2-4). Introductory course that progresses from fundamental logic gates through a sequential controller, covering both combinational and sequential circuits. Microcomputer architecture, interfacing and programming. Applications stressed. *Prereq: EE312 or EE332, or permission of instructor.*

EE322 Signals and Systems (3-0-3). The principles of circuit analysis are extended to the transmission of signals through linear systems. The approach is based on determination and interpretation of the natural frequencies, pole-zero diagrams, and their relation to the state equations. Transform techniques are applied to the analysis of analog filters. *Prereq: EE232.*

EE331 Electrical Engineering I (3-2-4). A study of fundamental DC and AC electrical circuits. Circuit analysis includes natural and forced response of first and second-order systems; the sinusoidal steady state is investigated in both time and frequency domains. The characteristics of transformers and rotating machines using previously learned techniques of analysis and modeling complete the course. *Prereq: SM211, SP212.*

EE332 Electrical Engineering II (3-2-4). Continues student's survey of electrical engineering. Semiconductor theory is introduced and includes the study of applications of diodes and transistors. Emphasis is placed on understanding, modeling, and use as amplifiers and switches. Combinational and sequential digital logic applications are introduced. The course finishes with a study of the methods of AM and FM modulation and demodulation. *Prereq: EE331.*

EE341 Electronics I (3-2-4). Each major semiconductor device (p-n junction diode, bipolar and field effect transistors) is introduced by presenting a physical picture of its internal behavior. This approach leads naturally to device characterization in terms of appropriate external variables and allows small-signal and large-signal models to be constructed. Emphasis is on large-signal and digital applications of the devices, especially in integrated circuit form. Applications are emphasized in the weekly laboratory exercises. *Prereq: EE221.*

EE342 Electronics II (3-2-4). Small signal and analog applications in integrated circuit operational amplifier designs. Hybrid parameter and hybrid Pi models are used to predict voltage, current and power gains; input and output impedances; and frequency response of single-stage and cascaded amplifiers. The feedback concept is discussed in detail, stability is treated quantitatively and the relationship between "amplifier" and "oscillator" is developed. The course concludes with power circuits and systems. *Prereq: EE341.*

EE362 Communications Electronics (3-2-4). Principles of radio transmitters and receivers. Tuned impedance-matching circuits and tuned transformers. Tuned small signal amplifiers. Oscillators, phase-locked loops, mixers. Mathematics and spectra of ampli-

tude-modulation (AM), frequency modulation (FM) and phase modulation (PM) signals. Typical circuits for generating and for demodulating these signals. Historical perspectives and alignment techniques. Radio-frequency transmission lines and the use of the Smith chart. Power amplifiers with tuned outputs and with transmission-line transformers. *Prereq: EE342.*

EE421 Energy Conversion (3-2-4). Characteristics and construction of electromagnetic devices which configure power and control systems, including motors, generators, and transformers. Equivalent circuits are developed and used to predict performance under steady-state and dynamic conditions. Laboratory time is spent to determine parameters of equivalent circuits and to compare actual performance with predicted. *Prereq: EE221 or EE331.*

EE423 Electrical Engineering Design (2-2-3). Practice in engineering. Each midshipman chooses a project and writes a report that describes in detail exactly what the student intends to build. Following approval by the instructor, the midshipman builds, troubleshoots and packages the proposed circuit. Student devotes remainder of term to gathering performance data and writing a final project report. *Prereq: EE342.*

EE424 Electronic Instruments and Measurements (2-4-4). Fundamentals of electronic measuring instruments with emphasis on digital instruments and on the use of mini and microcomputers in measurements. Not offered every year. *Prereq: EE341.*

EE431 Communications Theory I (3-2-4). An introduction to analog and digital communication systems and concepts. Fourier spectrum and information content of a signal are defined, characteristics of linear filters are explored and the sampling theorem is developed and applied. Amplitude, frequency, phase and pulse-code modulation techniques are studied in depth. Time and frequency division multiplexing concepts are developed and applied. Signal to noise ratios in analog communication systems are compared and statistical techniques are used for computer error rates in digital communication systems. *Prereq: SM311, EE362 or EE332 or permission of instructor.*

EE432 Communications Theory II (3-2-4). Basic digital signal processing principles are studied and applied to modern radar, sonar and communications systems. Discrete Fourier Transform (DFT) is introduced, its properties are explored and the Fast Fourier Transform (FFT) algorithm is developed. Correlation, convolution, spectral analysis, matched filter detection and complex demodulation techniques are explored using the FFT algorithm. Digital filters are designed and applied to random and deterministic signals. Statistical concepts (PDF, CDF) are introduced to study random errors in spectral analysis. Laboratory work involves the use of small, high-speed minicomputers to solve practical design problems in this field. *Prereq: EE431 or permission of instructor.*

EE451 Electronic Properties of Semiconductors (3-0-3). Develops an understanding of those semiconductor parameters that relate to the performance of semiconductor devices. Hole and electron conduction and charge carrier distribution as a function of energy are developed. Charge carrier generation and recombination and carrier dynamics leading to drift and diffusion are used to study semiconductor transport phenomena. The p-n junction and the bipolar junction transistor are studied in detail. *Prereq: SP222 or instructor permission.*

EE452 Semiconductor Electronics (3-2-4). An introduction to the physics and technology of planar silicon devices and integrated circuits. The physics of the silicon-silicon dioxide interface is developed and is used to study the MOSFET. Analysis and design of digital integrated circuits is emphasized. The laboratory involves an individual student research project. *Prereq: EE451.*

EE461 Microcomputer-Based Digital Design (3-2-4). A principles-based foundation to the concepts and techniques used in analyzing and designing traditional and microprocessor-based digital systems. The student will acquire a detailed understanding of the system bus; the architecture and interfacing of various processor, memory, and input-output elements; the instruction set; and assembly-language programming. Emphasis is on concepts that will have long-term value. This course is supported by a continually updated laboratory. *Prereq: EE342 or EE332.*

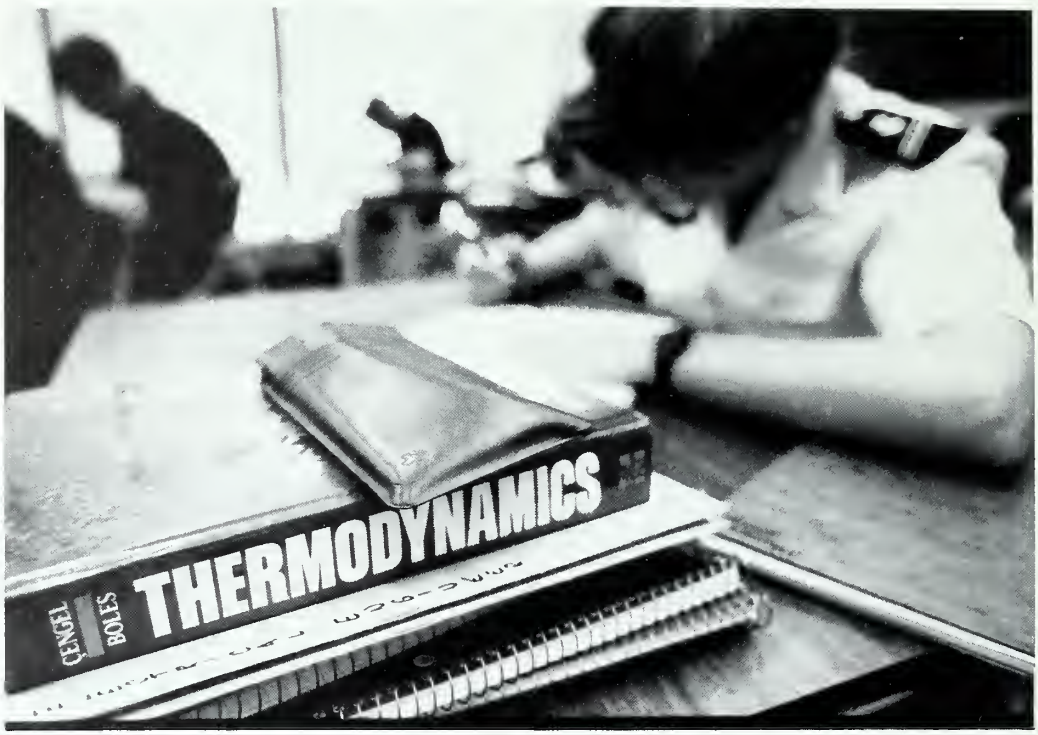
EE462 Microcomputer Interfacing (2-4-4). This course provides a strong foundation in techniques for connecting computers to peripherals and communications devices, and in the methodology for programming the computer to control external devices in real time. Principles that support the technology are stressed to prepare the

student for self-education in the future; this is an absolute necessity in this rapidly changing field. This course is supported by a project-oriented laboratory. *Prereq: EE461.*

EE471 Microwave Systems (3-2-4). An introduction to the nature of magnetic waves. Time varying Maxwell equations are developed and solutions to wave equations presented. Characteristics of microwave components such as power sources, amplifiers, filters and waveguide are considered. The methods of distributed parameter circuit analysis are introduced. Applications of microwave devices in systems are discussed with emphasis on systems integration. *Prereq: SP342.*

EE478 Naval Sensors (3-0-3). Theoretical principles of passive and active naval sensors operating within the frequency spectrum from audio to visible. Emphasis on conceptual fundamentals which bind together seemingly diverse sensor systems such as: sonar; navigation; radio; television; radar; electromagnetic compatibility; electronic counter-countermeasures; identification, friend or foe; laser range finders; infrared imagers; and low level light television. *Prereq: EE471 or SP436.*

"If you don't manage your time, you are either in for a long four years or a very short stay here at the academy."



Department of Mechanical Engineering

Mechanical Engineering Major

The mechanical engineering major, accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, offers one of the most diversified engineering programs available at the Naval Academy. Students acquire a sound and balanced background in engineering fundamentals, science, mathematics and the humanities, while gaining theoretical and practical knowledge over the full spectrum of engineering applications. Electives allow study of advanced concepts. Additional opportunities for development as an engineer are offered through student chapters of engineering societies.

Mechanical engineering majors study under civilian and military instructors of varied backgrounds and wide professional experience. Laboratories in materials science, process control, solid mechanics, fluid dynamics and thermodynamics, and in other interdisciplinary fields, provide support. These include some of the finest undergraduate engineering facilities in the country. Graduates are awarded a bachelor of science degree in mechanical engineering and have a solid base for future graduate studies in engineering and for professional registration.

A Navy or Marine Corps officer with a bachelor's degree in mechanical engineering is well equipped for a wide variety of career assignments both ashore and afloat. Operational sea billets in surface ships, submarines and aircraft squadrons provide many opportunities for a mechanical engineer to develop practical experience in a warfare or engineering specialty area while contributing to fleet engineering and material readiness. The operational environment enables a junior officer to rapidly develop sound leadership and managerial abilities while refining mechanical engineering capabilities acquired at the Naval Academy.

Ashore, the mechanical engineer has a wide range of opportunities in subspecialty billets with naval applications. These include such areas as ship and aircraft design, propulsion systems, environmental systems, advanced engineering education, major project management and weapons systems acquisition. Just as there is an abundant and continuing need for mechanical engineers throughout today's naval service, there is also great potential for a satisfying, rewarding and productive career.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM212, SM221;
Science: SP211 and SP212;
Humanities: HH205, HH206, and two electives;
Engineering: EE331, EE332, EM211, EM217, EM232, EM319, EM324, EM313, ES300, ES410;
Major: EM320, EM371, EM411, EM471, EM472, EM477, plus three major electives; one free elective.

General Engineering Major

The general engineering major gives the student a basic technical education in mathematics, science, engineering fundamentals, and naval professional engineering subjects. It is intended to provide an adequate background for future naval technical training and education. Midshipmen completing the general engineering major receive a designated bachelor of science degree. The major is not accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM212, SM221;
Science: SP211, SP212;
Humanities: HH205, HH206 plus two electives;
Engineering: EE311, EE312, EN200, EN405, ES300, ES400;
Major: EE313, EM211, EM217, EM232, EM327, EM328, EM313, plus two major electives, one restricted technical elective and two math/science/engineering electives; one free elective.

Mechanical Engineering Courses

EM211 Statics (3-0-3). An initial course in applied vector mechanics with emphasis on static equilibrium. Topics include forces, moments, couples, equivalent force-couple systems, centroids, distributed forces, and Coulomb friction. The application of the free body diagram in the analysis of static equilibrium of frames, machines, and trusses is stressed. *Prereq: 4/C mathematics; Coreq: Calculus III and General Physics I.*

EM214 Elements of Materials Science (2-2-3). An introductory course in the physical, electrical, and mechanical properties of engineering materials including their structures, use in engineering application, environmental effects, and modes of failure. *Prereq: 4/C chemistry; Coreq: Calculus III.*

EM217 Strength of Materials (3-2-4). A first course in mechanics of deformable bodies with emphasis on the engineering approach to the responses of these bodies to various type loadings. Topics include stress-strain relationships, stress-strain analysis, load-deflection, bending, torsion, buckling, temperature effects, and dynamic response. *Prereq: EM231; Coreq: SM212.*

EM232 Dynamics (3-0-3). A course in classical vector dynamics. Topics include vector algebra and calculus, kinematics and kinetics of particles and rigid bodies, as well as energy and momentum methods. Extensive problem solving involving particle and rigid body motion is required. *Prereq: EM211; Coreq: SM212.*

EM313 Materials Science (3-2-4). An introductory course in the physical and mechanical properties of engineering materials including metals, ceramics and plastics, their structures, use in engineering applications and failure phenomena. All laboratory projects are structured to provide strong physical illustrations for the topics covered in lectures. *Prereq: EM217.*

EM318 Applied Fluid Mechanics (3-0-3). A first course in incompressible fluid mechanics. Topics include properties of fluids, fluid statics, integral conservation equations, differential field analysis, dimensional analysis and similitude, incompressible boundary layers, viscous flow in conduits and flow about immersed bodies. *Prereq: EM319 or equivalent.*

EM319 Engineering Thermodynamics (3-0-3). A basic thermodynamics course in which the first and second laws of thermodynamics are studied primarily from the classical macroscopic viewpoint and applied to both closed and open systems. Working substances include perfect gases, real gases and vapors in addition to solids

and liquids. Naval applications are emphasized. *Coreq: SM212.*

EM320 Applied Thermodynamics (2-2-3). Laboratory equipment which operates on principles of thermodynamics and fluid mechanics is used to reinforce analyses and designs of gas and vapor power cycles, refrigeration and air conditioning, ship and aircraft propulsion systems, combustion, energy conversion, and compressible flow. *Prereq: EM319 or equivalent.*

EM324 Fluid Dynamics (3-2-4). An introductory course in fluid dynamics stressing both the integral and differential forms of the conservation laws of fluid flow. Engineering applications are made to hydrostatics and to ideal and real fluid flows. Laboratory experiments and problems sessions complement the lectures. *Prereq: EM319 or equivalent.*

EM327 Essentials of Fluid Dynamics (3-0-3). An introductory study of the behavior of fluids at rest and in motion. Effects of various fluid properties and forces on flow patterns force interaction between fluid and its boundaries, and the application of these principles to practical, applied problems are presented. *Prereq: SM212 or SM202.*

EM328 Thermodynamics (3-0-3). An introductory course in classical thermodynamics stressing the understanding and application of the basic laws of thermodynamics. A logical development of the relationships among physical properties and their application in the thermodynamic analyses is presented. *Prereq: SM212.*

EM371 Introduction to Design (2-2-3). Fundamentals of mechanical design, with emphasis on the design of pertinent machine elements. Topics such as fasteners, springs, anti-friction bearings, lubrication and journal bearings, gearing and shafts are covered. *Prereq: EM217, EM232.*

EM411 Heat Transfer (3-0-3). Study of thermal radiation, steady and transient conduction, laminar and turbulent convection, internal and external flow, boundary layers and empirical correlations. Applications address fins, nuclear reactor cooling, heat exchangers and interactive computing. *Prereq: EM319 and EM324.*

EM417 Intermediate Mechanics of Materials (3-0-3). A continuation of EM217: elastic-plastic stress-strain, torsion, bending, transverse loading of unsymmetrical beams. Deflection, energy methods, plate and shell theory. *Prereq: EM217.*

EM423 Mechanical Vibrations (3-0-3). The treatment of vibration fundamentals, including free, damped, and forced harmonic vibrations of linear single and multi-degree of freedom systems, transient and nonperiodic vibrations, continuous systems, and random vibration analysis. *Prereq: EM217, EM232, SM311.*

EM428 Thermal-Fluid Computational Methods (3-0-3). A variety of numerical approximation techniques including finite element and predictor-corrector methods are used to analyze conduction, convection and radiation heat transfer problems. Solution stability, convergence criteria and error analysis techniques are also discussed. In addition, students are introduced to state-of-the-art thermal fluids codes for solution to advanced problems. *Prereq: EM324 or equivalent.*

EM432 Computer Methods in Structural Mechanics (3-0-3). Structural design and analysis; matrix formulation employing flexibility and stiffness methods of analysis, computer languages, and techniques in structural design. Topics include temperature effects, effects of settlement of supports, and misfit of structural parts. *Prereq: EM217.*

EM434 Advanced Mechanics of Materials (3-0-3). Topics include theories of elasticity and plasticity, stress and strain as tensors, compatibility and constitutive relationships, energy methods, stability, yield functions, behavior of time dependent materials, plasticity limit theorems, plastic design. *Prereq: EM217, SM311.*

EM442 Computer Graphics and Engineering Mechanisms (3-0-3). Mathematical theory of computer graphics; including curves, surfaces, transformations, and projections. Use of computer graphics to analyze the behavior and calculate the properties of mechanisms such as cams, gears, and 4-bar linkages. *Prereq: 1/C or 2/C standing.*

EM443 Energy Conversion (3-0-3). Introduction to energy conversion and utilization. Terrestrial and thermodynamic limitations, direct energy conversion devices, alternative energy sources, present and future energy research design and development, and energy usage and economy are presented. *Prereq: EM319 or equivalent.*

EM446 Environmental Systems Engineering (3-0-3). Principles of thermodynamics, heat transfer, and fluid mechanics as applied to the design and control of thermal environments. Cycles and equipment for heating, cooling, and humidity control. Air transmission, distribution, and cleaning are also considered. *Prereq: EM319 or equivalent.*

EM450 Compressible Flow and Turbomachinery (3-0-3). Fundamental principles of fluid dynamics and thermodynamics are applied to one-dimensional compressible flows. Topics include varying-area isentropic flow, flow with friction, flow with heat transfer, and normal and oblique shock waves. Introductory concepts in the design and analysis of turbomachinery are covered. *Prereq: EM320, EM324.*

EM453 Physical Metallurgy (3-0-3). Study of the principles of physical metallurgy including imperfections in crystal structures, liquid and solid phases of metals, phase transformations, and solid-state reactions with applications to metallurgical processes such as casting and welding. *Prereq: EM313 or EM214.*

EM454 Mechanical Behavior of Materials (3-0-3). Treatment of mechanical behavior from a materials viewpoint. Elastic, elastic-plastic, and viscoelastic behavior are treated, as well as modes of fracture, including brittle and ductile. Scanning electron microscopy is performed for fractography. Ductile-to-brittle transition, elastic and elastic-plastic fracture mechanics, fatigue, and creep are considered. *Prereq: EM214 or EM313 and EM217.*

EM461 Combustion: Principles and Applications (2-2-3). An introductory course in combustion science covering basic principles and applications. Fuel science topics such as solid, liquid, and gaseous fuel sources; heating values of fuels; combustion products; and environmental impacts are covered. The principles of combustion are then applied to a variety of internal and external combustion systems both analytically and experimentally. *Prereq: EM324 or equivalent.*

EM471 Mechanical Engineering Experimentation (2-2-3). Planning experiments and making measurements. Statistical inference plan; data analysis; detailed work on thermocouples and strain gauges; pressure, flow, vibration, and other measurements; and testing for signal validity. *Prereq: 1/C standing in mechanical engineering major or approval of department chair.*

EM472 Mechanical Design (2-2-3). A detailed study of the engineering design process emphasizing the integration of objectives, analysis of alternatives and synthesis of components. Practical experience is gained by participation in team projects. *Prereq: EM371, or approval of department chair.*

EM477 Computer-Aided Design (2-2-3). A design course using the workstation environment and selected software in mechanisms and fluid mechanics to synthesize solutions based on performance related objectives. *Prereq: EM371.*

ME486 Corrosion and Corrosion Prevention (2-2-3). This course presents the various types of corrosion, describes the electrochemical and metallurgical mechanisms responsible for each, and details the methods of prevention for each. The course concentrates principally on the marine environment and on structural alloys utilized in the marine environment. The various protection methods currently used in the marine environment are also emphasized. The laboratory sessions involve demonstrations and hands-on experiments which complement the lecture material. *Prereq: EM313 or EM214.*

"The academic environment at the Naval Academy is outstanding. Although the courses are difficult, the professors are always available for extra instruction, the system ensures that learning takes place along with the grading process."

Department of Naval Systems Engineering

Marine Engineering Major

The marine engineering major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The major is concerned with the analysis and design of energy systems. Energy -- its shortage, its efficient use, and pollution caused by its use -- are problems tackled by the marine engineer. The marine engineer's task is to develop propulsion plants to move ships at optimum operational speeds while using as little fuel as possible. Improvements in efficiency of all types of power plants are needed -- conventional steam, gas turbine, diesel, and nuclear. Today's marine engineers are also engaged in developing new fuels and technologies. They are developing lightweight reduction gears and superconductive motors and generators. They are studying the feasibility of using closed-cycle helium turbines for ship propulsion plants.

Midshipmen majoring in marine engineering develop a sound understanding of the principles of ship design and construction; of problems involved in analyzing and designing systems for use in the ocean environment; of the principles of fluid dynamics, heat transfer, and reactor physics; and of the techniques and methods utilized in power plant design and analysis. They have ample opportunity to broaden this knowledge through participation in individual and group design projects under the direction of faculty members representing a wide range of technical backgrounds and practical experience. This major is particularly suited for midshipmen considering Nuclear Power School and a nuclear Navy career following graduation, an area which continues to grow in importance with each nuclear submarine and surface ship entering the fleet.

Among the outstanding laboratory facilities available to marine engineers in Rickover Hall are a steam power plant, gas turbines and diesel engines, a sub-critical nuclear reactor and a high-energy neutron generator.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM212, SM221, SM311;
Science: SP211, SP212;
Humanities: HH205, HH206 and two electives;
Engineering: EE331, EE332, EM211, EM217, EM232, EM319, EM324, ES300, ES410;
Major: EN241, EN361, EN362, EN380, EN443, EN460, EN463, EN467, plus two major electives; one free elective.

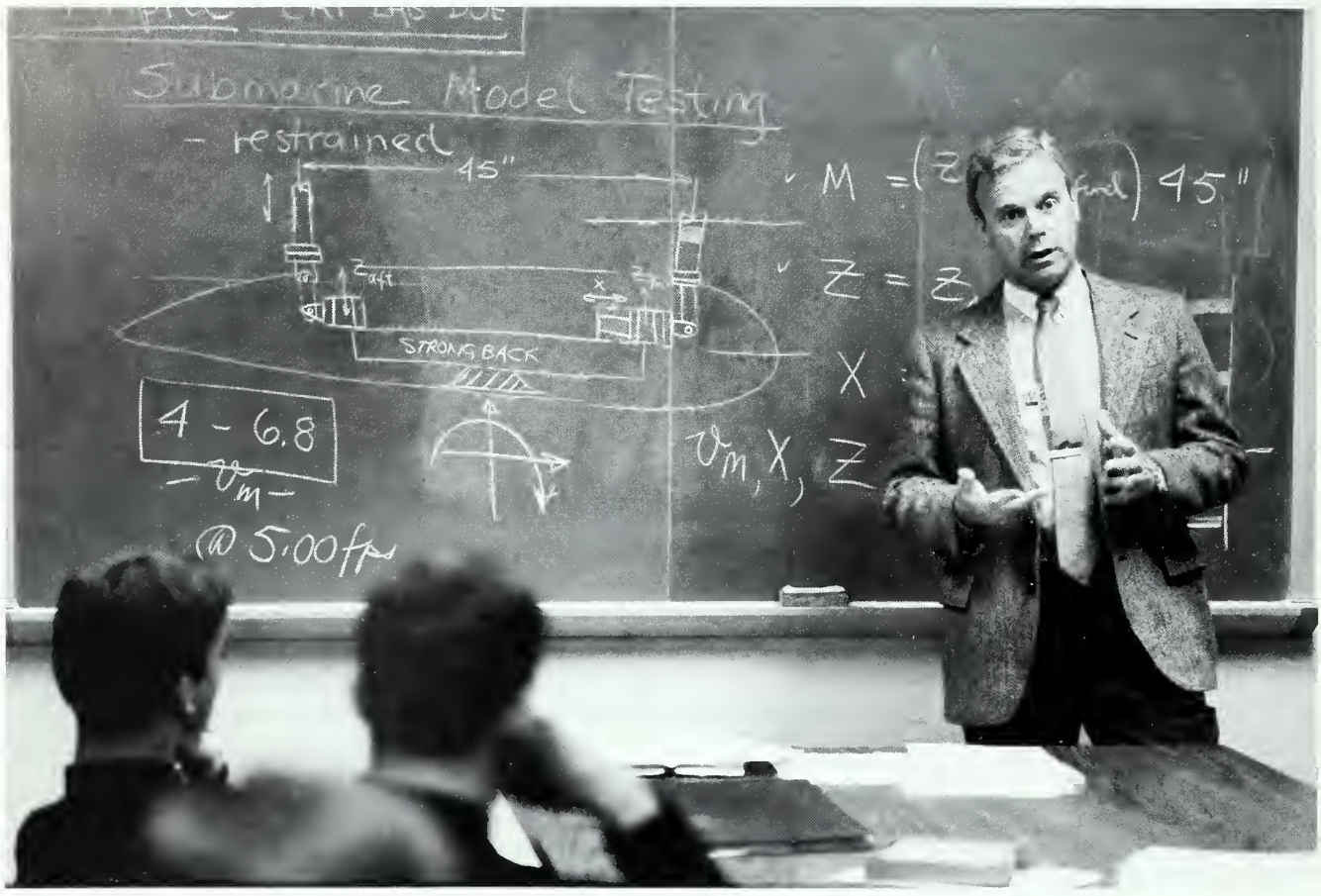
Naval Architecture Major

The naval architecture major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The major is unlike most engineering disciplines that are unified by the nature of the phenomena involved. This major originally came into being as a discipline because of a single end-product, the ship. A special combination of knowledge and experience is needed to develop, design, and build this single product. Variety exists not only in the kinds of work (design, research, cost-estimation, management), but also in the types of craft involved -- from sailboats to aircraft carriers, hydrofoil boats to catamarans, and submarines to surface-effect vehicles.

Naval architects use both art and engineering in designing ships. Armed with imagination and experience, they convert functional requirements into a suitable, cost-effective design. They analyze and select the best dimensions and hull form, calculate the power requirements, and estimate the weights of the principal components. They design and analyze the hull structure and decide on the location of military sub-systems, machinery spaces, accommodations, and stores. Additionally, the ship must be divided into watertight compartments so that, if damaged, the chances of survival are maximized. Weighing and compromising all such conflicting needs in the design of the ship are the creative and challenging responsibilities of the naval architect.

Naval architecture at the Naval Academy approaches these topics in a fully integrated program of classroom sessions, hands-on laboratory work, field trips, and the latest in computer-aided design and analysis techniques. Two towing tanks, a circulating water channel and a static stability tank are some of the many facilities available to midshipmen majoring in naval architecture. A distinguished and innovative faculty complement these outstanding facilities and contribute to making this one of the finest undergraduate majors available in its field. A bachelor of science in naval architecture is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM212, SM221;
Science: SP211, SP212;
Humanities: HH205, HH206 plus two electives;
Engineering: EE331, EE332, EM211, EM217, EM232, EM318, EM319, ES300, ES410;
Major: EN243, EN341, EN353, EN358, EN361, EN380, EN455, EN471, EN476, plus two major electives; one free elective.



Ocean Engineering Major

Ocean engineering is the key to the last frontier on earth -- the ocean depths. Ocean scientists have provided us with a basic knowledge of the ocean environment; it is up to the ocean engineer to apply modern engineering principles in order to enable us to work in and utilize this environment more effectively. By blending the fundamentals of mathematics, physics, materials science and oceanography with the basic elements of civil, mechanical and electrical engineering, the ocean engineer is able to apply this knowledge to ocean materials, power systems, acoustics, wave mechanics, life support systems, ocean energy and a wide variety of ocean vehicles and offshore and coastal structures.

The ocean engineering major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The major offers an integrated program of study, utilizing a balance between classroom theory, laboratory work and practical application providing midshipmen with the background to work effectively as ocean engineers. Laboratory experiments are conducted in the 120-foot towing tank and coastal engineering basin. Both are equipped with pneumatic wave-makers and instrumented with sophisticated sensors and on-line data acquisition and analysis equipment. A circulating water channel, hyperbaric test facility, a sediment and materials laboratory and an environmental chamber are also available. The Naval Academy's computer systems are used in solving design problems and preparing computer-aided designs. Supervising, directing and teaching this program are the faculty and staff of the naval systems engineering department -- a team of professionals recognized for providing one of the finest undergraduate majors in ocean engineering available in America. A bachelor of science in ocean engineering is awarded.

"There aren't any easy classes, only less difficult ones."

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM212, SM221;
Science: SP211, SP212;

Humanities: HH205, HH206, and two electives;
Engineering: EE331, EE332, EM211, EM217, EM232, EM324, ES300, ES410;
Major: EM319, EN241, EN380, EN441, EN461, EN462, EN475, SO221, plus three major electives; one free elective.

Naval Systems Engineering Courses

EN200 Naval Engineering I (3-2-4). An introduction to ship systems, including basic methods of ship procurement, construction and powerplant selection. Principles of ship stability and operability as related to preventive and corrective damage control. *Prereq: EN100, SP211, 3/C cruise.*

EN241 Introduction to Naval Systems Engineering (3-0-3). This course provides an application of basic mathematics, physics and mechanics to marine vehicles and static marine systems. It provides a background in naval architecture and ocean engineering to prepare a midshipman for future major electives offered by the department. Specific topics include ship stability, resistance and powering, maneuvering principles, materials in the ocean and marine structural principles. *Prereq: EM211 or EM231 or permission.*

EN243 Introduction to Naval Architecture (2-2-3). The terminology, nomenclature and analytical tools of naval architecture are introduced. A ship's lines plan is drawn. Theories and procedures for describing and computing a ship's hydrostatic properties, weights and centers are taught. *Prereq: EM211 and ENA major.*

EN300 Naval Engineering II (3-2-4). A study of naval engineering systems, including the principles of energy conversion and the basic operation of steam, gas turbine and internal combustion engine powerplants. *Prereq: SP211, 1/C cruise.*

EN320 Micro Computer Aided Engineering and Design (2-2-3). A fundamental course in engineering applications of the personal computer. Covers problem-solving techniques utilizing computer-aided design, spreadsheet and equation modeling software. Develops skills required to undertake an engineering research or design project. *Prereq: engineering major.*

EN341 Stability and Buoyancy (3-0-3). Predicting a ship's hydrostatic response to various conditions is addressed. Theories and procedures for computing the transverse and longitudinal stability of both intact and damaged ships are studied. Floodable length computations are covered. Stability and subdivision criteria are taught. *Prereq: EN242.*

EN353 Resistance and Propulsion (3-2-4) Topics include dimensional analysis, similitude, wave and viscous resistance of ships, ship-model testing techniques, full-scale performance prediction, momentum theory of propulsive devices and propeller vibrations and design. The course also covers the experimental aspects of marine vehicle resistance and propulsion. *Prereq: EN341, EM318 or EM324.*

EN358 Ship Structures (3-2-4). A course in structural theory and practice. Topics include longitudinal and transverse strength of the hull girder, bending moments in a seaway, plate theory, development of ship structural design, submarine pressure hull design and shipbuilding materials. *Prereq: EM217, EN351.*

EN361 Marine Power Systems (2-2-3). Applies the concepts of thermodynamics, fluid dynamics and other fundamental principles to marine power systems. Includes the combustion of fuels to produce heat energy and how it is converted to power in engines, steam power plants and gas turbines. Topics covered are psychrometrics, air conditioning, heat pumps, diesel engines, gasoline engines, gas turbines, steam turbines, incompressible flow, compressible flow, mass/energy balance, heat exchangers, computer aided design and experimental design. *Prereq: EM319; Coreq. EM318 or EM324.*

EN362 Reactor Physics I (3-0-3). An introductory course in nuclear reactors covering fission, neutron diffusion, material and geometric buckling and the critical equation. Bare and reflected homogeneous reactors are studied. *Prereq: SM212 or equivalent.*

EN380 Naval Materials Science and Engineering (3-0-3). Deals with the optimal use of materials in ocean systems with emphasis on corrosion prevention. *Prereq: EM217.*

EN382 Ocean Materials Science And Engineering (3-2-4). Deals with optimal use of materials in ocean systems with emphasis on corrosion prevention, fracture mechanics and basic materials science. Laboratory projects include heat treatment, mechanical testing of metals and corrosion and fouling studies. *Prereq: EM217*

EN405 Naval Applications of Thermodynamics (2-2-3). Provides practical applications for the thermodynamics principles previously acquired, concentrating on marine propulsion systems and their components. Covers the interrelationships between components of a given propulsion plant and the application of basic thermodynamics, fluids and heat transfer theory to these systems. Prereq: *EM319 or EM 328, general engineering major.*

EN420 Coastal Engineering (2-2-3). A study of littoral drift and wave action on coastal structures. Topics include littoral drift past a river estuary, breakwaters, jetties, groins and harbor design. *Prereq: EM217, EM324, EN441, or equivalent.*

EN430 Underwater Work Systems (3-0-3). Acquaints the student with design and operational considerations for manned submersibles, unmanned remotely operated vehicles and deep dive systems. *Prereq: 1/C engineering major or permission of department chair.*

EN440 Design of Foundations for Ocean Structures (3-0-3). Design and analysis of gravity pile and anchored foundations for ocean and coastal facilities fixed to the seafloor. Includes recommended practices and procedures for planning, designing and constructing adequate foundations for marine structures. *Prereq: Permission of department chair.*

EN441 Ocean Engineering Structures (3-0-3). Structural design considerations for fixed ocean structures, mooring systems and undersea vehicles are analyzed. Design techniques including matrix methods and finite element analysis are introduced. Boundary conditions, wave effects, foundations, loading and materials considerations are studied. *Prereq: EM217.*

EN443 Marine Engineering Design I (2-2-3). Design of marine machine elements. Topics include fundamentals of engineering economics, design factors, materials, design of bearings, fasteners, power screws, gears, springs and shafting for marine power systems. *Prereqs: EM217 and EM232.*

EN450 Engineering Economic Analysis (3-0-3). Basic methods and reasons for conducting an engineering economic study are presented. Economic criteria are developed. Procedures for making a selection from among a set of technically feasible alternatives are studied. Assumptions and implications associated with these decision-making procedures are discussed. *Prereq: FE210 and 1/C standing.*

EN451 Analytical Applications in Ship Design (3-0-3). The design process and analytical tools required for effective decisions in the design of marine systems are studied. Methods for the analysis and transformation of available data are developed and evaluated. Once procedures for establishing the technical feasibility of a design have been addressed, emphasis shifts to the proper resolution of decisions dominated by economic considerations. *Prereq: 1/C standing as naval architecture major or permission of department chair.*

EN452 Advanced Ship Structures (3-0-3). Provides an understanding of forces acting on a ship's hull and the use of current technologies to calculate the structural response. Specific topics include: statistical representation of the sea surface to determine design values of structural response; structural analysis using Finite Elements; methods for the ultimate strength analysis of stiffened panels and hull modules; and introduction of plastic frame analysis of the ship's primary structure. *Prereq: EN358.*

EN454 Ship Vibrations (3-0-3). A ship is a complex elastic structure in which vibration may be caused by periodic forces generated by waves, propellers or machinery. The basic concepts of vibration, as well as hull, propeller and machinery-induced vibrations, are considered. *Prereq: EM232.*

EN455 Seakeeping and Maneuvering (3-2-4). Topics include ship steering, maneuvering, motion and seakeeping. The basic equations of motion for a maneuvering ship and for ship motions in a seaway are developed, and various methods of solution are discussed. The course also covers the experimental aspects of seakeeping and maneuvering. *Prereq: EN352; Coreq: EN467.*

EN456 Computer Applications in Naval Architecture (3-0-3). An introduction to computer-aided ship design is presented. Topics include numerical procedures applied to form, stability, resistance, propulsion, motion, maneuvering and strength. *Prereq: EN352 or permission of department chair.*

EN457 Hydrofoil and Propeller Design (3-0-3). The analysis and design of hydrofoils and marine propellers are presented. Lifting line and lifting surface theories are applied to naval devices. Design and towing tank work supplements recitations. Not offered every year. *Prereq: EN352 or permission of department chair.*

EN458 Advanced Marine Vehicles (2-2-3). Modern watercraft discussed: planing boats,

hydrofoil craft, ground-effect machines, and combatant and research submersibles. Analysis and design features are investigated experimentally in the towing tank when appropriate. *Prereq: EN453.*

EN460 Marine Engineering Design II (2-2-3). Conceptual design of a marine system is accomplished by midshipmen teams. The realistic project format followed involves proposal writing, project manager designation, progress reports, and preparation and design review by experts. *Prereq: 1/C standing as an engineering major.*

EN461 Ocean Systems Engineering Design I (2-2-3). A detailed study of the engineering design process is undertaken, including requirements definition, design synthesis, alternative evaluation, criteria optimization and project presentation. Practical experience is gained through design of basic structural elements for fixed ocean facilities. *Prereq: 1/C standing in ocean engineering major or approval of department chair.*

EN462 Ocean Systems Engineering Design II (1-4-3). Conceptual design of an ocean engineering system is accomplished by midshipmen teams. The realistic project format followed involves proposal writing, project manager designation, progress reports, and design review by experts. *Prereq: EN461.*

EN463 Reactor Physics II (2-2-3). The topics covered include neutron generation times, reactor period, delayed neutrons, negative temperature coefficient, xenon poisoning, control rod theory, shielding, and finally, a reactor kinetics case problem. *Prereq: EN362*

EN466 Computer Methods in Nuclear Engineering (3-0-3). Transient reactor problems are studied using computer numerical methods. Topics include the dynamic analysis of the primary and secondary power loops for a nucleas reactor. Matrix, finite difference, and Hansen's methods are used. *Prereq: EN463 or permission of department chair.*

EN467 Thermal Engineering (3-0-3). Gas Turbine, Diesel and Steam power plant components are analyzed. Heat transfer and its application to design of power plant components and systems is studied. *Prereq: EM319; Coreq: EM324.*

EN468 Nuclear Energy Conversion (3-0-3). Principles of the conversion of nuclear energy into useful power are covered. Various types of nuclear power plants, their design, cycles, load following characteristics, etc., are studied. Direct nuclear energy conversion systems are also studied. *Prereq: EN362.*

EN470 Life Support Systems (3-0-3). The physiological and psychological aspects of man in the sea are presented with the related engineering requirements. Topics include hyperbaric physiology, saturation diving, life support equipment, deep dive systems, diving operations and hazards. *Prereq: 1/C engineering major or permission of department chair.*

EN471 Ship Design I (2-2-3). This course introduces the student to the requirements and procedures for accomplishing the design of a ship. The preliminary design of a small monohull displacement ship is developed. Relevant design resources and techniques are used. *Prereq: EN352 and EN358.*

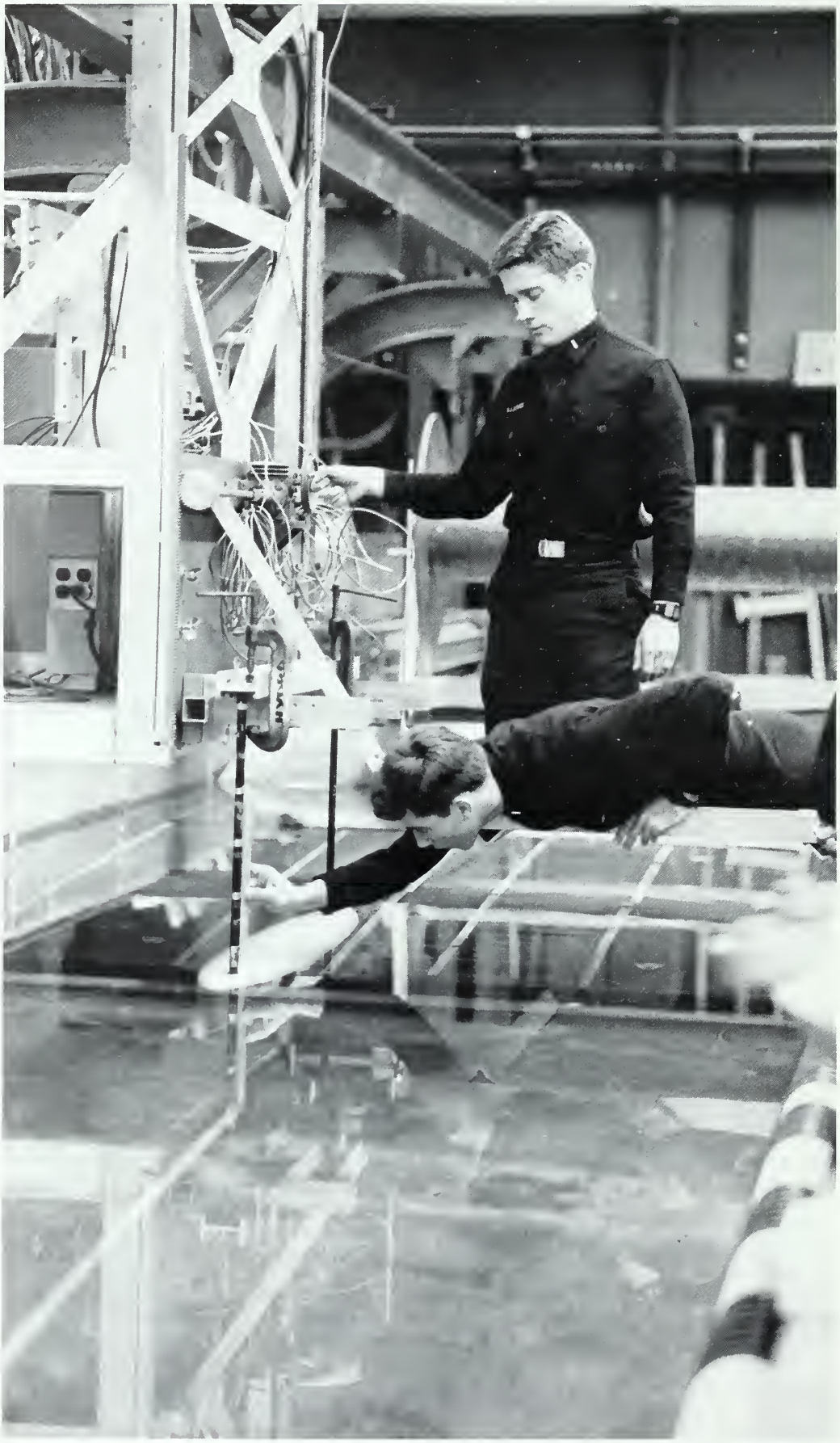
EN475 Ocean Engineering Mechanics (3-2-4). Effects of gravity waves on surfaced and submerged floating bodies and on moored and fixed bodies. Measurement techniques discussed include measurements of wave height, wave-induced forces, and motions in waves. *Prereq: EM318 or EM324, EN241 or permission of department chair.*

EN476 Ship Design II (0-6-3). In this course, which represents the culmination of an undergraduate naval architecture program, the student applies engineering skills to the design of a ship. *Prereq: EN474.*

EN477 Undersea Power Systems (3-0-3). The principles of design of undersea power systems are presented. Topics include batteries, fuel cells, chemical-dynamic systems, radioisotopes and nuclear reactor systems, and cable systems. *Prereq: EE332, EM318 or EM324, EN241 or permission of department chair.*

EN478 Submarine Design Analysis (3-0-3). This course is offered to familiarize midshipmen with the naval architectural aspects of submarine design and to expose them to curent design analysis methods for submarines.

EN479 Computer-Aided Design of Floating Platforms (3-0-3). Utilizes the numerical methods available for the optimized design and configuration of various floating platforms, namely, catamarans, semi-submersibles, deep submersibles, drilling platforms, etc. *Prereq: EN241.*



"My best friends went to some of the best engineering colleges in the nation and will be great engineers when they graduate. Like my friends, I'll be a great engineer, but unlike them my education will have included English, history, and other humanities courses."

Department of Weapons and Systems Engineering

Systems Engineering Major

Modern systems, from microwave ovens, stereos and automobiles to spacecraft, missiles and robots, are a complex combination of different engineering disciplines. Systems engineering is the science of combining diverse technologies into a single unit and the control of that unit to achieve its design purpose.

The Naval Academy's systems engineering curriculum, rated number one in the country for more than 10 years, is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. It is an interdisciplinary major encompassing electronics, mechanics, vibrations, linear physical systems, automatic control systems, computer engineering and system simulation. Analysis and simulation tools include analog, digital and hybrid computers. An overall understanding of the analysis and design of complete engineering systems, including the interdisciplinary interfaces between systems, is the primary goal of the major. Systems engineering is particularly suited to those persons interested in the interactions and performance of a complete system. A bachelor of science in systems engineering is awarded.

Since most modern systems contain automatic control functions using digital control methods, the core of the systems engineering major emphasizes feedback control theory with digital control as a major element. Surrounding this core of control theory is the interdisciplinary part of the major with advanced courses in digital technology and microprocessors, computer interfacing and engineering, analog and digital communications, analog and digital simulation and robotics. As a part of the interdisciplinary concept, portions of the systems engineering major may be fulfilled with advanced courses from other disciplines, such as mechanical or electrical engineering, math, physics or computer science.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM212, SM221, SM239, SM 312;
Science: SP211, SP212;
Humanities: HH205, HH206 and two electives;
Engineering: EE331, EE332, EM211, EM232, EM318, EM319, ES300;
Major: ES201, ES303, ES305, ES306, ES309, ES402, ES416, plus five major electives; one free elective.

Systems Engineering Courses

ES201 Introduction to Systems Engineering (2-2-3). Introduction to the modeling and control of electrical, mechanical, and hydraulic systems. A survey of the simulation and control laboratory courses available in systems engineering. *Coreq: SM212.*

ES300 Naval Weapons Systems (3-0-3). An introduction to the theory of weapons systems through a study of the fundamental principles of sensor, tracking, computational and weapons delivery subsystems. *Prereq: NS101, SM102, SP212, SC104.*

ES303 Analog/Digital Computer Methods (2-2-3). Principles of analog and digital computer simulation of linear and nonlinear multivariable systems are applied to the study of the behavior of realistic engineering control systems. *Prereq: ES201; Coreq: ES305.*

ES305 Linear Control Systems I (3-0-3). A study of the dynamic behavior of physical systems through classical transform and modern state variable techniques. *Prereq: ES201; Coreq: ES303.*

ES306 Applied Control Systems and Instrumentation (2-2-3). Determination of mathematical model parameters of physical systems by statistical analysis of laboratory data. Comparison of predicted and actual system response. Introduction to hybrid computation. *Prereq: ES303, ES305; Coreq: ES309.*

ES309 Linear Control Systems II (3-0-3). Analysis and design of linear automatic control systems. *Prereq: ES303, ES305; Coreq: ES306.*

ES400 Weapons Systems Engineering (4-0-4). A study of the engineering principles governing the functioning of the various components (in detection, control, delivery, and destruction) of naval weapons systems. *Prereq: ES300, 1/C at-sea training, EN300, EE312.*

ES402 Systems Engineering Design (2-4-4). Introduction to the macro-techniques of engineering design including performance, reliability, management control, redundancy, man-machine systems and testing techniques. Design, construction, test and evaluation of an approved project is accomplished in the lab. *Prereq: ES306, ES309.*

ES406 Analog Information Systems (3-0-3). Study of analog information flow and signal-to-noise and signal-to-jamming ratios in communication systems. *Prereq: ES306, ES309, ES412.*

ES407 Hybrid Computer Computation (1-4-3). Introduction to hybrid computation, hardware and software consideration of hybrid interface, digital filter and controller simulations, and solution of boundary value and optimization problems using hybrid techniques. *Prereq: ES306 or consent of instructor.*

ES408 Digital Technology (2-2-3). An introduction to logical organization and internal functioning of digital devices applying sequential machine theory, machine language, Boolean algebra and switching circuits.

ES409 Modern Control Systems (3-0-3). Analysis and design of control systems using modern control theory. *Prereq: ES306, ES309.*

ES410 Control Systems and Their Application to Weapons (3-2-4). Linear control systems for engineering majors, using analytical, graphical and computer techniques. *Prereq: 1/C standing in an engineering major or approval of department chair.*

ES412 Digital Information Systems (2-2-3). Analysis of digital information and its transfer through communications systems. *Prereq: 1/C standing in an engineering major or approval of department chair.*

ES414 Sampled Data and Digital Control Systems (2-2-3). Analysis, design and simulation of digital filters and continuous systems under digital control using z-transforms and modern control techniques. *Prereq: ES306, ES309.*

ES415 Nonlinear Control Systems (2-2-3). Analysis and design of control systems having nonlinear components. *Prereq: ES306, ES309.*

ES416 Advanced Control Systems (3-0-3). A study of advanced topics of automatic control systems including compensation, modern control theory, and nonlinear analysis, and selected topics in research techniques. *Prereq: ES305, ES309.*

ES442 Microcomputers in Control Applications (2-2-3). An introduction to the role of the microcomputer as a component in control systems, applying assembly language programming techniques and a variety of interface hardware. *Prereq: ES408.*

ES451 Introduction to Robotic Systems (2-2-3). Fundamentals of robotic systems including historical development, applications, basic configuration and design considerations, control principles of robot systems, computer vision processing and a group design project. *Prereq: 1/C standing in systems engineering major or approval of department chair.*

"So far I've been amazed that my largest class had 23 people. I talk to people at other schools with classes of 200 to 300 people. I prefer my odds of learning the material over that of students at other schools."

Division of Humanities and Social Sciences

Department of Economics
Department of English
Department of History
Department of Language Studies
Department of Political Science

Department of Economics

Economics Major

The major in economics is designed to acquaint prospective naval officers with both macro- and micro-economic theory, quantitative methods in economics, economic problem-solving in an institutional context, and international economic relations of the United States. A bachelor of science degree is awarded. An honors program with a designated honors degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM221, SM230;
Science: SP211, SP212;
Humanities: HH205, HH206 and two electives;
Language: Four semesters of a modern language;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400;
Major: FE210, FE312, FE331, FE341, FE486, and five major electives; one free elective.

Economics Courses

FE210 Basic Economics (3-0-3). An introductory course in elementary economic theory and its application to contemporary problems. Topics include income determination, monetary policy and institutions, public finance, price theory and international trade.

FE220 Accounting (3-0-3). An introductory course in the basic principles of accounting. Cannot be taken for HUM/SS credit.

FE301 Financial Analysis (3-0-3). A study of the theory and techniques of financial analysis applied in the federal government and industry. *Prereq: FE210 and FE220.*

FE310 Economic Geography (3-0-3). Provides a systematic understanding of economic growth and the issue of finite limits to improved living standards around the world. Studies population growth, the resources of the principal nations of the world, industry location, international trade,

commodity cartels and the requirements for continued technological advances. *Prereq: FE210.*

FE311 History of Economic Thought (3-0-3). Traces the evolution of economic doctrine from the ancients to modern day with emphasis on the period since the 18th century. Reviews the contributions to economic knowledge by Smith, Malthus, Ricardo, Marx, Mill, Marshall, Keynes and others. Various schools of thought, including mercantilism, classical, neo-classical, historical, institutionalism and Keynesianism are examined. *Prereq: FE210.*

FE312 Macroeconomics (3-0-3). The significance and determinants of the aggregate levels of income and employment, the price level, consumption, interest rates, investment, alternative monetary and fiscal policies. *Prereq: FE210.*

FE315 Economics of Developing Nations (3-0-3). Study of the economic characteristics, problems and policies of developing nations, covering economic growth patterns in Third World nations, their changing role in the international economic order, and the different economic routes being employed toward economic progress. *Prereq: FE210.*

FE320 Cost Accounting (3-0-3). A study of concepts and techniques of cost accounting. Primarily concerned with the derivation of production cost arising from materials, labor, services employed and overhead. Cannot be taken for HUM/SS credit. *Prereq: FE220.*

FE321 Comparative Economic Systems (3-0-3). An introduction to the study of alternate forms of economic organization, with emphasis on comparing the ideological basis, structure and performance of capitalist, socialist and mixed economic systems. *Prereq: FE210.*

FE331 Economic Statistics (2-2-3). Survey of descriptive and inferential statistical techniques involving more than one variable. Strong emphasis on regression analysis and use of computers. *Prereq: FE210.*

FE335 Economics of National Defense (3-0-3). The application of economic analysis to defense decision-making, and the consequences of defense decisions for weapons; volunteers vs. conscription; leaders vs. resource managers; Soviet vs. U.S. spending; competitive vs. monopoly contractors; pay vs. non-pay factors in reenlistment. *Prereq: FE210.*

FE341 Microeconomics (3-0-3). Theories of the economic behavior of consumers and producers, the determination of final good and factor prices, market structures and general economic equilibrium. The application of price theory to business problems and public-policy issues. *Prereq: FE210.*

FE345 Environmental Economics (3-0-3). Economic evaluation of policies involving conflicting public and private uses of natural resources. Topics include environmental benefit and cost measurement, causes and consequences of pollution, management of depletable and renewable resources, and the economics of energy. Not offered every year. *Prereq: FE210.*

FE354 Development of the U.S. Economy (3-0-3). Economic theory is used to analyze the evolution of the U.S. economy; among topics considered are the American Revolution, westward expansion, slavery, industrialization, market concentration and the Great Depression. *Prereq: FE210.*

FE361 Urban Economics (3-0-3). Study of economic growth and structure and economic problems of cities, with attention to poverty, transportation, housing and racial discrimination. Not offered every year. *Prereq: FE210.*

FE362 The Economics of Technology (3-0-3). An analysis of productivity growth, characteristics of invention and innovation, determinants of research, and development activities of government and business; the economic impact of automation, and reindustrialization. *Prereq: FE210.*

FE400 Advanced Microeconomic Theory (3-2-4). Advanced topics in modern microeconomics with particular emphasis on dynamic analysis, the role of risk and uncertainty in economic decision making, general equilibrium analysis and welfare economics. *Prereq: FE331, FE341 and FE412 or FE422 or FE431 or FE434 or FE460.*

FE401 Quantitative Economic Techniques (3-0-3). Quantitative approach to theoretical and applied economic problems. Methods taught include order quantity models, linear programming, network models, microeconomic resource allocations, macroeconomic models, life cycle cost problems and cost-benefit analysis. *Prereq: FE341.*

FE405 Advanced Macroeconomic Theory (3-2-4). Advanced topics in modern macroeconomics, including new classical, new Keynesian, and expectation formation. Introduction to macrodynamics, business

cycle and growth models. Emphasis on empirical macromodels. *Prereq: FE312, FE331, FE341 and FE412 or FE422 or FE431 or FE434 or FE460.*

FE412 International Trade and Finance (3-0-3). A rigorous course which examines the current international issues in a theoretical and empirical framework. Topics include motivations for trade; trade versus protectionism; the multinational enterprise; exchange rate issues and the international monetary systems, and the role of the International Monetary Fund and World Bank. *Prereq: FE312 or FE341.*

FE422 Economics of Labor Relations (3-0-3). A study of the distribution of income with emphasis on the demand for and supply of labor services; the choice-theoretic behavior of firms and individuals in the determination of wages and the employment level. Topics analyzed include human capital theory, occupational choice, the unemployment-inflation relationship, and the wage effects of discrimination and unions. Union history, labor laws and institutions are discussed. *Prereq: FE341.*

FE431 Public Finance (3-0-3). The use of government expenditures and taxation in a market economy to change the allocation of resources and to modify the distribution of income. Examination of the economic effect of government budgetary policy. Microeconomic theory and federal tax and budgetary institutions are emphasized. *Prereq: FE341.*

FE434 Money and Banking (3-0-3). A consideration of central and commercial banking institutions; an investigation of the demand for money and its role as a focal point for monetary policies designed to obtain full employment, price stability and international monetary equilibrium. *Prereq: FE312.*

FE445 Econometrics (3-0-3). Quantification of basic economic theory; multiple regression, correlation, and identification techniques for the construction and testing of economic models, and a study of selected alternative models of particular economic interest. *Prereq: FE331, FE341 and Calculus I & II.*

FE460 Public Policies Toward Business (3-0-3). An examination of public regulation of private enterprise in the U.S. with emphasis on the rationale for and application of antitrust policy and direct regulation. *Prereq: FE341.*

FE500 Honors Research Seminar I (2-0-2). Examination of techniques and methodology of social science research; students will choose topics for development in FE506. *Prereq: 1/C honors economics major.*

FE506 Honors Research Seminar II (3-2-4). Directed independent research on topics chosen in FE500. Emphasis on empirical work using microcomputers. *Prereq: 1/C honors economics major.*

"There are a lot of majors offered, but you have to pick one early. Be prepared to know what you want when you get here."

Department of English

English Major

The majors program in English offers study of the most significant and influential writings of civilization from ancient times to the present as well as the opportunity for independent study and for creative writing projects. A bachelor of science degree is awarded.

An honors program with a designated honors degree is available for selected students. Built on the premise that students wishing to excel will do so within the framework of the regular major, the honors program requires rigorous concentration in literary period courses, through special seminars focusing on literature and the fine arts and on special topics studied in depth.

In addition to the honors program, midshipmen may take advantage of the Trident Scholar program, study abroad, a poetry competition and the English Majors' Club. The department of English also arranges a full schedule of trips to cultural centers in Washington and Baltimore to take advantage of musical and dramatic offerings. For those inclined to be on the stage themselves, the Masqueraders, a highly regarded drama group, offers a major production each year.

Choosing a major in English will not limit career selection in a highly technical Navy or Marine Corps. The qualities of a superior officer must include creativity, communication skills and independent thinking, all of which are strongly encouraged in English classrooms.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM221, SM230;
Science: SP211, SP212;
Humanities: HH205, HH206 and two electives;
Language: Four semesters of a foreign language;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400
Major: Ten major electives; one free elective.

English Courses

HE101 Practical Writing (3-0-3). The study and practice of grammatically correct and rhetorically effective expository prose, supplemented by the analysis of essays by professional writers. For students selected by English department.

HE111-112 Rhetoric and Introduction to Literature I & II (3-0-3, 3-0-3). Stresses the writing of rhetorically effective and grammatically correct expository prose. During the first semester students read essays, short stories and plays, and they write brief essays. During the second semester students read novels and poetry and write longer essays.

200-Level Courses:
General Description

The literary content of courses on this level is eclectic. These courses offer wide surveys of materials from different cultures, historical periods, literary types and issues. In each course substantial practice in writing is to be expected. If a term paper is required, prior to the submission of such a paper there will also be several essays or written exercises to test and evaluate the student's writing competence. There are no prerequisites for any course in the 200 group. They may be taken at any class level, including the fourth-class year.

HE217 Western Literature I (3-0-3). A balanced survey of the Western literary tradition and its backgrounds, from the ancient Greeks through the Renaissance. Readings will include classical Greek and Roman epic, drama and philosophy (typically Plato and Aristotle); selections from the Old and New Testaments; medieval poetry, drama and philosophy (especially Dante and/or Chaucer); and Renaissance poetry, non-Shakespearean drama and prose.

HE218 Western Literature II (3-0-3). A balanced survey of the Western literary tradition and its backgrounds, from the Enlightenment through Romanticism to the various reactions to Romanticism beginning in the mid-nineteenth century, most notably realism, naturalism and modernism and its aftermath.

HE222 The Bible and Literature (3-0-3). The Bible and its influence on European and American literature. Emphasis will be placed on modern biblical literary-critical methodology and on the symbolic richness of derivative literature from Dante to Nikos Kazantzakis.

HE224 Literature and Science (3-0-3). The interrelationships among science, technology and literature since the Renaissance. The impact of science on literature and the implications of science as reflected in literary responses.

HE240 American Black Literature (3-0-3). Provides a survey of representative American black literature. Major figures including Toomer, Hughes, Wright, Ellison, Baldwin, Baraka, Brooks, Hayden and Morrison are stressed. The genres of short fiction, poetry, drama and the novel are covered.

HE250 Literature of the Sea (3-0-3). Study of the principal genres of the literature of the sea (epic, novel, short fiction and poetry). Emphasis on literary qualities, human relationships with the sea and problems of command.

300-Level Courses:
General Description

These courses build on the foundations of literary analysis, comprehension and writing acquired in HE111-112. The HE301-306 series goes more deeply into each of the basic literary types; the HE313-333 series approaches literature in its historical and cultural dimensions while focusing on a limited historical period; the HE343-344 series offers extensive practice in a variety of writing forms. All courses have a writing requirement intended to further the student's opportunity to improve skills. Prerequisites for all 300-level courses are HE111-112.

HE301 Patterns in Drama (3-0-3). Reading, viewing and analysis of a variety of dramatic experiences for the purpose of exploring the relationships among language, action and form.

HE302 Forms of Poetry (3-0-3). An examination of the variety of techniques by which language is shaped into poetry. The focus is on analytic methods for understanding poetry.

HE306 Types of Fiction (3-0-3). Ideas and issues of modern fiction, with particular emphasis on the conventions, techniques, forms and innovations of the novel and short story.

HE307 Topics in Film and Literature (3-0-3). A study of American, European and world films in conjunction with literary products related to them.

HE313 Chaucer and His Age (3-0-3). The literary and philosophical traditions within which Chaucer and his contemporaries worked. Readings in Chaucer's works, the Gawain poet and others, including early and late medieval writers from England and the continent.

HE314 The Renaissance Mind (3-0-3). Literature and thought of the period bracketed by the two great English epics, Spenser's *Faerie Queene* and Milton's *Paradise Lost*. The course includes a continental perspective, with readings from such authors as Machiavelli, Rabelais, Cervantes, Montaigne and Castiglione.

HE315 Satire and Sensibility in the Age of Reason (3-0-3). The literature of the Enlightenment (1660-1780). Readings from the prose and poetry of Dryden, Swift, Pope, Addison and Steele, Johnson and Boswell, as well as selected novels and such continental writers as Voltaire.

HE317 The Romantic Vision (3-0-3). Concentrates on how writers from 1798 to 1837 responded to the growth of industrialism, religious skepticism, nationalism and a host of other problems associated with modern life. Readings in representative works of the Romantic period. Readings from such continental writers as Goethe and Novalis may be included.

HE318 Modern British Literature (3-0-3). The literature of Great Britain and Ireland of the past hundred years. The novels of Hardy, Conrad, Joyce, Lawrence, Golding and Lessing; the plays of Shaw, Synge, O'Casey and Pinter; the poetry of Yeats, Eliot, Auden and Dylan Thomas.

HE319 The Victorian Frame of Mind (3-0-3). A study of the literature of England written during the last seven decades of the 19th century. Emphasis on writings that deal with the growth of religious skepticism, the rise of the middle class, general education and the increasing dehumanization of the individual in a society caught up in a new wave of scientific discovery and technological progress. Readings from representative figures such as Dickens, George Eliot, Hardy, Tennyson, Browning, Arnold, Ruskin, Carlyle and Darwin.

HE326 Literature of the American Dream, 1620-1860 (3-0-3). A survey of American literature from the time of the Pilgrims to the outbreak of the Civil War. Emphasis is on the relationship between the emerging culture and literature.

HE328 America's Literary Coming of Age (1860-1920) (3-0-3). A study of American literature from the Civil War to the development of the United States as a major industrial and military political power after World War I. Focus is on the American writer's response to his or her own culture and to that of the broadening world.

HE329 Modern American Literature: The 20th-Century Challenge (3-0-3). A study of American literature from 1910 to 1945 with emphasis on the writer's interpretation of the complexities of 20th-century life.

HE330 Contemporary American Literature: World War II to the Present (3-0-3). Concentrates on responses of contemporary writers to the idiosyncratic problems and themes of the post-World War II era, such as the nuclear age, computer technology, television, the Vietnam experience, racial questions, the debasement of the language and environmental issues.

HE333 Shakespeare and His Contemporaries (3-0-3). A study of Elizabethan and Jacobean ideas and attitudes through the investigation of a representative sample of Shakespeare's tragedies, histories and comedies as well as a few plays by contemporaries of Shakespeare.

HE343 Creative Writing (3-0-3). After completing initial problem-solving exercises in prose, poetry and drama, students embark upon an approved workload of their own design. Criticism of students' work is accomplished through classroom workshops and individual conferences with the instructor.

HE344 Professional Writing (3-0-3). Designed for students interested in advanced methods of preparing writing and presenting articles and reports. After initial study and analysis of the form and style in a wide variety of prose writing and practice in various prose forms, students will design and present independent projects.

HE360 Special Topics in Literature (3-0-3). An open-topics literature course. Topics vary from semester to semester and include such offerings as myth and fantasy, literature of American minorities, science fiction and images of women in literature.

400-Level Courses:
General Description

The HE400 series allows students and English department faculty members with special expertise to pursue together an intensive study of a restricted literary subject. Emphasis in each course will be upon extensive and intensive reading in a limited body of material, techniques of research and the development of independent critical judgment. Prerequisites for these courses are at least one 300-level English course and permission of the chair.

HE442 Introduction to Literary Criticism (3-0-3). The theory and practice of literary criticism. Concentrates on what critical approaches can yield to the reader in the way of deeper understanding and satisfaction from the work of art. Required of all honors English majors.

HE461 Studies in a Literary Period (3-0-3). In-depth study of a limited period in literary history. For example: Pope and his literary contemporaries, the beginnings of Romanticism, the American Renaissance (1830-1860) and the 1920s in American literature.

HE462 Studies in a Literary Problem (3-0-3). Cutting across traditional divisions of nationality, historical period or genre, the materials of this course will be selected to focus on some timeless problem of literature and the human existence it reflects. For example, myth and symbol in literature, literature and science, the concept of the hero.

HE463 Studies in Literary Figures (3-0-3). Extensive reading in the works, biography and criticism of major figures in world literature. Among those studied are Milton, Wordsworth, Dickens, Joyce, D.H. Lawrence, Melville, Twain, Faulkner, Dostoevsky, Thomas Mann. No more than three such writers will be considered in any one semester.

HE467 Studies in a Literary Genre (3-0-3). Study in a special genre. For example, the epic, the autobiographical novel, science fiction, imagist poetry.

HE506 Seminar in Arts and Literature (3-2-4). This interdisciplinary course introduces students to Western art and music, showing how the arts in any age reflect the corresponding philosophical and scientific theories and mirror the ideals and realities of their representative cultures.

HE507 Advanced Topics (3-2-4) This course for English honors students offers concentrated exploration of individual literary masterpieces or issues.

"The requirements of a basic English course and history course are vital to the education of future officers."

Department of History

History Major

The major in history provides an opportunity to examine the evolution of past civilizations, and to evaluate and understand the institutions, achievements, ethics and values of mankind through the ages. History majors learn to evaluate ideas critically: to sift evidence, to draw conclusions and to express their conclusions clearly and concisely. A clear understanding of the events of the past provides a more acute awareness of contemporary issues and problems, as well as a context and a process for evaluating those problems. The program includes introductory courses on the values and ideas of Western civilization and on the historical role of the U.S. Navy and Marine Corps. Majors will select upper-division courses from the field of American, European, non-Western and naval and military history. A bachelor of science degree is awarded.

In addition to the three history courses in the core curriculum (HH104, HH205 and HH206) each history major will also take Perspectives on History (HH262) and a Seminar in Advanced Historical Studies (HH462). These courses introduce the students to historiography and the techniques of historical research and writing and enable them to pursue an historical issue in depth. The department also requires each history major to take at least one American history course, one European history course, one cross-national course and one regional course from among those listed below.

The honors program in history offers a student with above-average ability and ambition an opportunity to pursue a more challenging curriculum and to earn honors degree. Those accepted for the program will follow the normal history major, with the following exceptions: they will take two Honors Colloquia (HH507 and HH508 in second class year) in place of two history electives; and they will take an Honors Research Seminar (HH509 in the fall of first class year). Each honors student will also write a major research paper.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM221, SM230;
Science: SP211, SP212;
Humanities: HH205, HH206 and two electives;
Language: Four semesters of a foreign language;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400
Major: HH262, HH462, and seven major electives; one free elective.

History Courses

HH104 American Naval Heritage (3-0-3). This course examines the antecedents, origins and development of the United States Navy within the framework of America's growth as a continental and, eventually, global power, with particular emphasis on the development of naval and maritime strategy.

HH205 Western Civilization: Culture, Ethics and Society to 1776 (3-0-3). Analyzes the historical evolution of ethical thought and its impact upon European politics and culture from the Classical Age to the Enlightenment. Given that a society's culture expresses the ethical concerns, ideals and aspirations of its members, this course approaches the development of Western civilization to 1776 through a study of its ideas and institutions. By studying the critical moral and pragmatic choices made by societies and individuals through the ages, this course examines the ethical legacy of the past in order to illuminate and deepen the student's understanding of the values and institutions of contemporary Western society.

HH206 Civilization and the Atlantic Community: Culture, Ethics and Society Since 1776 (3-0-3). Pursues the study of Western values and ideas from the American Revolution to the present. In this course, the intellectual and ethical legacy of Europe is examined as a major influence upon the development of American culture. Particular emphasis is placed on the impact of Enlightenment ideas on the American and French revolutions (including an examination of the U.S. Constitution), the impact of the industrial revolution on the values and ideas of Western society and on the integration of the West with the world in the twentieth century.

HH241 Survey of American History (3-0-3). A survey of American history from discovery to the present, emphasizing the political, diplomatic, social and economical developments that explain the nation's rise from settlement to superpower.

HH262 Perspectives on History (3-0-3). A methodology course in which majors acquire the basic technical skills required for research and writing in subsequent courses in history and other humanities and social sciences disciplines. *Prereq: history major, 3/C.*

HH311 Athenian Democracy (3-0-3) Examines the origins of Western democracy in 5th-century B.C. Athens. Focus is on the problems of democratic constitutions in settling foreign policy, surviving extended wars, administering foreign territories and dealing with questions of inequality at home.

HH312 Imperial Rome (3-0-3) Study of the most successful of Western states with emphasis on models for bureaucratization, military defense and the incorporation of various ethnic groups.

HH315 The Age of Chivalry (800-1450) (3-0-3) Traces the transformation of Europe from the waning years of the Roman Empire through the period of rebirth known as the Renaissance. Examines how the modern European nation-states, economic systems, educational institutions and legal systems emerged from this medieval world. The period covered will be examined not as a time of decline and stagnation, but as one of almost frantic change and startling regeneration.

HH316 Early Modern Europe (3-0-3). Focuses on the emergence of modern civilization (1500-1763) from the discoveries and rediscoveries of the Renaissance, the sweeping changes brought by the Reformation and Counter-Reformation and the excitement of both scientific and political revolution.

HH317 Radicals and Revolutionaries (3-0-3). A study of those individuals and groups who challenged and, in some instances, transformed European society from the 17th to the 20th centuries. Emphasis is placed on both the origins and consequences of radicalism and revolution.

HH318 War and Society in Modern Europe (3-0-3). A study of the origins and consequences of war on European society. The societal response to both total and cold war is assessed. War is examined as a force promoting change, including responses ranging from fascism through European economic unity.

HH321 Revolutionary Russia -- Peter the Great to Lenin (3-0-3). A study of Russian history from the founding of Moscow to 1917, examining the domestic and external forces responsible for shaping the structure of Russian society and culture.

HH322 The Soviet Union (3-0-3). An examination of the Revolution of 1917 and the development of the Soviet Union, emphasizing the institutions and policies adopted to meet domestic and foreign problems.

HH327 Germany and the Nazi Experience (3-0-3). Focuses on the antecedents of national socialism, including the Second Reich and World War I eras, the Nazi experience itself, and the legacy it bequeathed to today's German state.

HH329 Modern France: Napoleon to DeGaulle (3-0-3). This course examines France from the revolutionary upheaval of the late 18th century through its role in the Western world since World War II. Roughly the first half of the course will deal with the revolutions of 1789 and 1792 and their impact upon 19th-century France. The second half of the course will consider the experience of France in the 20th century and the changes forced upon the nation by two world wars fought on French soil.

HH330 Imperial Britain (3-0-3). Great Britain from 1750 to the present. Begins with an analysis of Britain's political and social institutions. It then examines the changes brought about by industrialization at home, revolutions abroad, and expansion of the empire. At its end, the course highlights the simultaneous eclipse of Britain as a world power and the increasing prosperity of the masses of the British people.

HH331 Art and Ideas in Modern Europe (3-0-3). Explores the transformation of culture in the modern world. Examines how artists and intellectuals reacted to the long-range impacts of the democratic and industrial revolutions. Emphasis is placed on development of the fine arts in relation to pivotal ideas from 1750 to present. *Prereq: HH206.*

HH332 European Diplomatic History (3-0-3). A study of the major governmental figures of modern Europe who helped shape the diplomatic history of the modern world as seen through their contributions to the art of international political decision-making.

HH333 Modern European Social History (3-0-3) Examines European society from the pre-modern through the modern era with special focus on changes in the structures of society and economy. Includes consideration of such issues as demography, family patterns, social conflict, gender and modernization.

HH345 Colonial America (3-0-3). The origins of American civilization from the Age of Discovery to 1776. Emphasis is placed upon the founding of the colonies and their institutional development.

HH346 Revolutionary America and the Early Republic (3-0-3). Traces the revolutionary movement and the subsequent development of the new nation, emphasizing the coming of the revolution, the institutionalization of the revolutionary ideal, and the dual development of nationalism and sectionalism.

HH347 Civil War, Reconstruction and the Gilded Age, 1845-1896 (3-0-3). An examination of the political, economic and social developments from the origins of the Civil War to 1896, including the wounding of the nation in a civil war and the subsequent reunification.

HH349 Emergence of Modern America 1896-1945 (3-0-3). Examination of political, social, intellectual, diplomatic and economic aspects of American history from the Spanish-American War to the end of World War II. Special emphasis is placed on Progressivism, the emergence of the U.S. as a great power in World War I, depression and New Deal, and World War II.

HH350 United States Since World War II (3-0-3) A detailed examination of American history since 1945, including the onset of the Cold War in the 1950s, the domestic and foreign policy issues of the 1960s, Vietnam, Watergate and the Reagan era.

HH353 American Social History (3-0-3). An examination of American life and culture and the forces that have shaped them, emphasizing mass media, popular entertainment, religious movements and technological advances.

HH354 American Diplomatic History (3-0-3). An examination of American foreign relations from the War for Independence through the Cold War. Particular attention is paid to the policies of presidents and secretaries of state, and to the combination of forces that affected their conduct of the nation's foreign relations.

HH355 Art and Ideas in American Society (3-0-3). Examines the growth and development of intellectual concepts and artistic creativity in America from colonial times to the present. Emphasizes both the peculiarities of American creative and intellectual accomplishments and the place of those achievements in the broader Western tradition.

HH358 American Constitutional and Legal History (3-0-3). An examination of the Amer-

ican constitutional and legal systems from their pre-colonial background to the present. The course emphasizes the legal system as a product of American society during the particular era under consideration.

HH359 U.S. Sectional History: The West (3-0-3). Deals with the opening of the trans-Mississippi frontier. Topics emphasized include land policy, railroads, Indian wars and water policy.

HH360 U.S. Sectional History: The South (3-0-3). Tracks the development of distinctive regional subcultures within the American experience and focuses on unique regional contributions to the nation.

HH361 History of Modern China and Japan (3-0-3). An analysis of contemporary Asian problems which considers their cultural and institutional origins, their 19th-century development under the impact of western influence, and their culmination in contemporary Asian nationalism.

HH362 History of the Middle East (3-0-3). A long-range historical approach to the Middle East's role in world affairs and the development of its cultural, political and military institutions. Emphasis is placed on strategic and diplomatic considerations.

HH363 History of Latin America (3-0-3). The impact of Europe in the colonial period, the independence struggle, the rise of national states and the interplay of world forces upon the shaping of 20th-century Latin American life.

HH364 History of Africa (3-0-3). A survey of social, cultural and political developments on the African continent from the era before European colonization to the present.

HH365 History of South Asia (3-0-3). A survey of the history of modern India and its adjacent areas, such as Pakistan, Burma and southeast Asia. Concentrates on developments in this locale from the 19th century to the present.

HH380 History of Science and Technology (3-0-3). A cross-cultural survey of the history of scientific discoveries and their practical applications, from the early natural philosophers to the present, with emphasis on the scientific revolution of the 17th century, the Industrial Revolution and the information explosion of the 20th century.

HH381 The Martial Heritage to 1500 (3-0-3). Examines the development of tactics, strategy and military organizations from the Greek hoplite armies through the advent of gunpowder in the West. Places these developments in their social and economic context.

HH382 Warfare in the Age of Sail, 1500-1815 (3-0-3). Study of warfare on land and sea from the advent of gunpowder and the modern sailing ship to the end of the Napoleonic Wars. The expansion of Western culture throughout the world; the origins of the modern profession of arms; and the development of technology, tactics, strategy and logistics are examined in their social, political and economic context.

HH383 The Rise of the Age of Total War, 1815-1945 (3-0-3) Examines the dimensions of warfare and civil-military relations in a broad social context from the advent of gunpowder in the West to the end of World War II.

HH384 Recent Military and Naval History (3-0-3). Surveys recent military from 1945 to present. Conflicts dealt with include the Chinese Civil War, the Korean War, Vietnam and the Falklands lslands War.

HH462 Seminar in Advanced Studies (3-0-3). Offers midshipmen with a solid base in historical studies an opportunity to pursue the discipline at a level of greater sophistication. Taught in small, intensive seminars; individual sections will engage in a detailed examination of a selected historical topic. Each section will focus on a particular event or problem in history and on the interpretative debates surrounding it. *Prereq: 1/C History major, or permission of department chairman.*

HH507 Honors Historiography (3-2-4). This course focuses on a particular event or problem in history and then on the interpretive debates surrounding it. The student scrutinizes primary and secondary texts critically and discerns the role of ideologies in the formation of historical interpretations. The student learns to discriminate between conflicting interpretations and to judge the merits of historical analysis. *Prereq: Admission to the honors program in history.*

HH508 Historical Methods and Philosophy (3-2-4). This course examines the nature of historical awareness and thus serves as a capstone course for the undergraduate, honors program. It examines the subjective qualities of historical research and considers the ways in which individual historians handle

their own biases and those of the age in which they lived. *Prereq: HH507.*

HH509 Honor Senior Thesis (3-2-4). Under the guidance of a faculty advisor, students prepare a major research paper on a historical topic of their choice. Each student makes an oral presentation of the finished paper before the Honors Committee, honors students and faculty members. *Prereq: HH507, HH508.*

HH512 Honors Thesis Readings (2-0-2). After selecting a research topic and advisor, history honors students will engage in intensive reading of primary and secondary works related to the topic. *Prereq: History Honors.*

HH522 Research Techniques (1-0-1) Midshipmen will discuss with faculty and distinguished visiting scholars the techniques and problems of research. Midshipmen will evaluate their ongoing research in HH508 in relation to the experiences of established members of the historical profession. *Prereq: History Honors.*

Philosophy Courses

HP230 Introduction to Philosophy and Logic (3-0-3). A survey of Western secular philosophy based on readings in representative philosophers; the basic problems of philosophical inquiry and a variety of solutions to them; principles of logic.

HP232 Ethics (3-0-3). A critical examination of systems of values and standards, with a discussion of current moral issues.

HP336 Philosophy of Religion (3-0-3). A philosophical analysis of the central concepts and problems of the Judeo-Christian tradition. The nature of religion, faith, God, evil and immortality examined from Plato through the death-of-God theologians. *Prereq: 1/C or 2/C only, or permission of instructor.*

HP340 Philosophy of Science (3-0-3). An examination of the impact of science on 20th-century society, the values assumed by science and the nature of scientific discovery and experimentation. *Prereq: 1/C or 2/C or permission of instructor.*

Department of Language Studies

The department offers courses at all levels in French, German, Japanese, Russian and Spanish. Midshipmen majoring in economics, English, history or political science must complete or validate a total of four semesters of a given language and may continue with one or two advanced language courses. In other majors, midshipmen who validate a year or more of a language may take language courses at the 200, 300 or 400 levels in that language as humanities or social science electives. All midshipmen may take language courses at the 100 level as free electives. The department also offers minors in French, German, Spanish, Russian and Japanese. In French, German and Spanish the minor consists of 12 credit hours at the 300/400 level taken or validated at the Naval Academy. In Russian and Japanese, students may count the 200 level towards the minor.

Among the special features of foreign language study at the Naval Academy are state-of-the-art interactive computer-video and audio laboratories for intensive practice with native-speed speech in the target language and outstanding satellite reception facilities for viewing television programs from Latin America, Europe and the Soviet Union. There are also extraordinary opportunities for summer overseas language study under the auspices of the Captains Marshall H. Cox and A.H. Graubart Funds.

French Courses

FF101 & FF102 Basic French I & II (3-0-3, 3-0-3). Develops basic communicative skills, with an emphasis on speaking and listening comprehension.

FF201 & FF202 Intermediate French I & II (3-0-3, 3-0-3). Continues development of oral, reading, and writing skills using real-life situations. Emphasizes practical, everyday culture of French-speaking world. *Prereq: FF102.*

FF301 & FF302 Advanced French with Civilization Readings I & II (3-0-3, 3-0-3). Develops fluency in conversation and facility in reading and writing. Topics emphasize main aspects of French civilization. *Prereq: FF202.*

FF411 Development of French Civilization (3-0-3). From the origins to World War II. Emphasis is on both content and linguistic expression. *Prereq: FF302 or approval of department chair.*

FF412 Modern France (3-0-3). All aspects of contemporary France: geography, economy, institutions, society, politics and culture. Emphasis on both content and linguistic expression. *Prereq: FF302 or approval of department chair.*

FF421 & FF422 Representative Readings in French Literature I & II (3-0-3, 3-0-3). Analysis and discussion of works of leading writers of various periods. *Prereq: FF302 or approval of department chair.*

German Courses

FG101 & FG102 Basic German I & II (3-0-3, 3-0-3). Emphasizes the spoken language.

FG201 & FG202 Intermediate German I & II (3-0-3, 3-0-3). Continues development of oral, reading, and writing skills. Includes area and cultural topics. *Prereq: FG102.*

FG310 Introduction to Contemporary Germany (3-0-3). An introduction to the geography and political, economic and social systems of the Republic of Germany, in German. Stresses development of advanced German language skills. *Prereq: FG202.*

FG320 Introduction to German Literature (3-0-3). In German. Stresses development of advanced German language skills. *Prereq: FG202.*

FG411 Development of German Civilization. (3-0-3). Contemporary German society, institutions and national policies. *Prereq: FG310 or approval of department chair.*

FG412 Modern Germany (3-0-3). Reviews main currents of postwar German political history, culture and society. *Prereq: FG310, FG320 or approval of department chair.*

FG421 & FG422 Representative Readings in German Literature I & II (3-0-3, 3-0-3). Analysis and discussion of works of leading writers of various periods. *Prereq: FG320 or approval of department chair.*

Chinese Courses

FC301 & FC302 Advanced Chinese I & II (3-0-3, 3-0-3). Further development of audiolingual skills and competence in reading. Emphasis on Chinese cultural patterns. Uses video to boost listening comprehension. *Prereq: FC202. (Classes of 1992 and 1993 only).*

FC401 & FC402 Reading and Discussion in Modern Chinese I & II (3-0-3, 3-0-3). Selected texts on major aspects of Chinese areas, civilization and culture. Uses video to boost listening comprehension. *Prereq: FC302. (Classes of 1992 and 1993 only).*

Japanese Courses

FJ101 & FJ102 Basic Japanese I & II (3-0-3). Emphasizes the spoken language. Introduces *kana* script.

FJ201 & FJ202 Intermediate Japanese I & II (3-0-3, 3-0-3). Continues development of oral skills. Introduces reading and writing with *kanji* characters. *Prereq: FJ102.*

FJ301 & FJ302 Advanced Japanese I & II (3-0-3, 3-0-3). Further development of listening, reading and speaking skills. Introduction to Japan and Japanese culture. *Prereq: FJ202.*

Spanish Courses

FS101 & FS102 Basic Spanish I & II (3-0-3, 3-0-3). Uses a communicative approach with authentic video and readings.

FS201 and FS202 Intermediate Spanish I & II (3-0-3, 3-0-3). Stresses listening and speaking, with continuing development of reading and writing skills. Strong interactive video component. Includes area and cultural topics. *Prereq: FS102.*

FS301 Advanced Spanish with Civilization Readings (3-0-3). Develops fluency in conversation and facility in reading and writing. Listening comprehension skills are developed by an interactive video program. Topics emphasize main aspects of Hispanic civilization. *Prereq: FS202.*

FS304 Advanced Conversational Spanish (3-0-3). Develops proficiency in speaking and writing on topics based on literary selections, articles and recorded material on life in Hispanic countries. Program includes naval dialogues and terminology. *Prereq: FS202.*

FS412 Contemporary Latin American Civilization (3-0-3). Past and current social, economic, cultural and political patterns and problems. *Prereq: FS304 or approval of department chair.*

FS413 Spanish Civilization (3-0-3). Cultural history, contemporary institutions and society. *Prereq: FS304 or approval of department chair.*

FS421 Spanish Literature (3-0-3). Representative works such as *The Cid* and *Don Quixote* reflecting the culture, ethics and values of Spain in its major literary periods. *Prereq: FS304 or approval of department chair.*

FS422 Spanish American Literature (3-0-3). Novels, stories, essays, poetry and plays reflecting the culture, ethics and values of major Spanish American countries from modernism to the present. *Prereq: FS304 or approval of department chair.*

Russian Courses

FR101 & FR102 Basic Russian I & II (3-0-3, 3-0-3). Emphasizes the spoken language.

FR201 & FR202 Intermediate Russian I & II (3-0-3, 3-0-3). Continues development of oral, reading and writing skills with the emphasis on spoken Russian. Includes area and cultural topics. *Prereq: FR102.*

FR330 and FR340 Advanced Russian with Civilization Readings I & II (3-0-3, 3-0-3). Further development of communicative skills in Russian. Emphasizes listening, speaking and reading. Knowledge of main sociocultural periods from 9th through 20th centuries. *Prereq: FR202.*

FR411 Development of Russian Civilization (3-0-3). From the 10th century to World War II. *Prereq: FR340 or approval of department chair.*

FR412 Modern Russia (3-0-3). The Soviet Union since World War II; social, cultural, economic patterns; technology, armed forces; national policies. *Prereq: FR340 or approval of department chair.*

English Course

FX101 & FX102 English for Non-Native Speakers I & II (3-0-3, 3-0-3). Alternative to common plebe year courses HE111 & HE112. Emphasizes writing, American culture and values. *Prereq: approval of department chair.*

"If you cannot find a major at the Naval Academy that fits your interest, then you probably won't find one anywhere."

Department of Political Science

Political Science Major

The political science major is designed to provide prospective naval officers with an understanding of the structure and functions of domestic and international political systems and with a framework for the analysis of politics. The wide-ranging, interdisciplinary program develops political science skills sequentially by first requiring foundation courses in international relations and United States government, emphasizing familiarity with the Constitution each midshipman has sworn to defend.

Upper-level courses offer the opportunity to explore law, political theory, institutional and policy analysis and area studies of Europe, the Soviet Union, Latin America and Asia. The major is enhanced with courses in economics and foreign languages. There are summer internship programs in Washington and overseas and the possibility of graduate work in intelligence or national security affairs.

Each spring the political science department and the Division of Humanities and Social Sciences sponsor the Naval Academy Foreign Affairs Conference (NAFAC), which is run by midshipmen. NAFAC has become one of the foremost undergraduate conferences in the country, drawing professors and students from more than 140 colleges and universities in the U.S. and abroad, in addition to senior diplomats, military leaders and journalists.

A bachelor of science degree is awarded. An honors program with a designated honors degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM221, SM230;
Science: SP211, SP212;
Humanities: HH205, HH206, FE210 and one elective;
Language: Four semesters of a foreign language;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400;
Major: FP210, FP220, FP394, and seven major electives; one free elective.

Political Science Courses

FP130 United States Government and Constitutional Development (3-0-3). Areas of study include the basic concepts of American democracy, the Constitution and its development, the political process, and the structure and functions of the national government and the factors which influence its operation. Particular emphasis will be placed upon the legal and ethical demands upon governmental officials, both military and civilian, as defined by the constitution and laws made in pursuance thereof.

FP210 Introduction to International Relations (3-0-3). Introduction to the various approaches to international relations; the nature of the international political system; foreign policy analysis; the principles, theories and major problems of international relations.

FP220 Political Science Methods (3-0-3). A discussion of the philosophy of science for the political scientist; instruction in research methods with emphasis on quantitative techniques.

FP311 Public Policy and Administration (3-0-3). An analysis of the formulation and administration of public policy in the United States. Examines political issues and policy alternatives relating to budget, defense, health care, energy, education, regulatory and other governmental problems. *Prereq: FP130.*

FP312 Communism: Theory and Practice (3-0-3). Provides an understanding of the philosophical, historical and political evolution of communist ideology; its relevance to American interests; and its application and currency in todays world.

FP313 Science Technology and International Relations (3-0-3). The effects of science and technology on both the national and international political systems. Special emphasis is given to nuclear nonproliferation, space cooperation and environmental issues. *Prereq: FP210.*

FP314 Formulation of U.S. Foreign Policy (3-0-3). The formulation and execution of American foreign policies including the decision-making structure, military input to policy-making and the administration of foreign policy. Substantive policy is analyzed in light of decision-theory, ends-means and capability analysis. *Prereq: FP210 or FP130.*

FP322 Comparative European Politics (3-0-3). Using both a topical and comparative approach, this course focuses on the structures and functions of the political systems of the major western European nations. In addition, the course examines the institutions of the European Community and its potential to unify Europe politically and economically. The future of western European security and NATO conclude the semester. *Prereq: FP210.*

FP323 Comparative Latin American Politics (3-0-3). An analytical treatment of the structure and dynamics of independent Latin American political systems, individually and in comparison; parties, interest groups, the military, the church, revolution, foreign policy and political thought. *Prereq: FP210.*

FP324 Latin American International Politics (3-0-3). The inter-American system; patterns of inter-Latin American and extrahemispheric relations; the Latin American policy of the United States *Prereq: FP210.*

FP325 American Political Theory (3-0-3). A detailed analysis of the currents of American political theory from the 18th century to the present. *Prereq: FP130.*

FP326 The American Presidency (3-0-3). The growth and evolution of the Office of the President; executive agencies, their function, control, and problems. Special attention is given to the president's role as commander-in-chief and his relations with the legislative and judicial branches. *Prereq: FP130.*

FP328 The Legislative Process (3-0-3). Legislative politics with emphasis on the U.S. Congress. Constituencies and elections, the role of party and committees, and interaction with other political actors and institutions such as the Executive, the judicial branch, interest groups and the bureaucracy are among the topics studied. *Prereq: FP130.*

FP341 Political Behavior (3-0-3). An analytical treatment of political behavior from psychological, sociological and cultural perspectives. Focuses on the formation of attitudes through socialization and personality development.

FP355 Civil-Military Relations (3-0-3). The armed forces in American society and the political process. Special emphasis is on the use of case studies of, *inter alia*, Korea, the Cuban Missile Crisis, Vietnam, Beirut and Desert Shield/Storm as the primary vehicle for exploring the civil-military relationship. *Prereq: FP130.*

FP357 Chinese Politics (3-0-3). An examination of the Chinese political system with emphasis on the dynamic interaction of traditional and Marxist ideological forces. *Prereq: FP210.*

FP358 Ideology, Religion and Terrorism (3-0-3). The various aspects of terrorism with particular emphasis on terrorism as an instrument of ideological and nationalist groups, state terrorism of the left and right, and terrorism in its most recent religious-centered manifestations. *Prereq: FP210 or FP130.*

FP364 Vietnam: Perspectives on the Conflict (3-0-3). A study of the political and strategic decision-making in the Vietnam conflict. *Prereq: FP210 or FP130.*

FP365 African Politics (3-0-3). An introduction to the political trends and constitutional developments of present day African governments; their relations with one another and the rest of the world. Attention is directed to the U.S. security aspects of African national growth.

FP367 Soviet Politics (3-0-3). The development and disintegration of the modern Soviet political system.

FP368 Comparative Asian Politics (3-0-3). A systematic comparative approach to the study of Asian governments, their political, economic and military development, regional relationships and problems. *Prereq: FP210.*

FP369 Middle Eastern Politics (3-0-3). A comparative analysis of the domestic politics and foreign policies of Middle Eastern political systems. The conflict of states within this system and its international ramifications is stressed. *Prereq: FP210.*

FP370 Soviet Foreign Policy (3-0-3). Analysis of the geopolitical, ideological, institutional, cultural and economic factors affecting formulation and conduct of Soviet and Russian foreign policy in relation to other international actors. *Prereq: FP210.*

FP371 Asian International Politics (3-0-3). An examination of the Asian nations' political relationships with each other and the rest of the world, with special emphasis on U.S.-Asian relations. *Prereq: FP 210.*

FP372 Political Parties and Pressure Groups (3-0-3). A study of the dynamics of group politics in the American system of government. Emphasizes the roles played by parties, interest groups, public opinion and elections in the American political process. *Prereq: FP230.*

FP394 Political Theory (3-0-3). A study of political philosophy, with emphasis on the roots of democracy; the works of the major writers from Plato to the present.

FP397 Criminal Law and Justice (3-0-3). The nature of the criminal justice system and criminal law are analyzed with emphasis on leading Supreme Court decisions and the system's key actors and institutions -- police, the accused, defense and prosecution attorneys, judges and juries, incarceration and parole. *Prereq: FP230.*

FP407 Intelligence and National Security (3-0-3). Examines the nature, significance and development of intelligence including collection, counterintelligence, clandestine and covert action, and evaluation. Contemporary issues facing the intelligence community and case studies are included. *Prereq: FP210, FP230, 2/C standing and U.S. citizenship.*

FP408 International Law (3-0-3). A survey of the public law of nations, including the law of peace, the law of war and law of the sea. Problems and case studies are used extensively. *Prereq: FP210 and FP230.*

FP413 Constitutional Law: The Federal System (3-0-3). Theories of constitutional interpretation, judicial review, separation of the powers among the branches of federal government, and allocation of power between the federal and state governments. *Prereq: FP230.*

FP414 Constitutional Law: Civil Liberties (3-0-3). Due process, equal protection, free speech, freedom of religion, rights of the criminally accused and other guarantees of the Bill of Rights. *Prereq: FP230.*

FP421 National Security Policy (3-0-3). Stresses the interaction of domestic, foreign, and military considerations in the making and execution of national security policy. Case studies and national strategic estimates highlight the course.

FP437 International Organizations (3-0-3). A study of the expanding role of international organizations (particularly in the security field) since the end of World War II. Special attention is given to the U.S. in major regional systems, and to the U.S. role in multilateral diplomacy. *Prereq: FP210.*

FP438 Comparative Government and Politics of Developing Areas (3-0-3). Governmental and political problems, institutions, and behavior in developing areas. Political thought, impact of change, leadership, and organization in Africa, Asia and Latin America. *Prereq: FP210.*

FP486A Research In Washington (3-0-3). A course designed to introduce students to the unique resources of Washington, D.C. Students will receive an intensive introduction to such resources as the computer systems at the Library of Congress and the Federal Elections Commission and commercial data bases. *Prereq: 1/C, by permission.*

FP486B Soviet National Security Policy (3-0-3). This course will focus attention on the manner in which Soviet foreign policy is formulated and implemented and identify key characteristics of contemporary Soviet/Russian natonal security policy. The course examines Soviet/Russian world perceptions and strategic aims. *Prereq: FP210.*

FP486H Low Intensity Conflict (3-0-3). This course will explore in detail the major aspects of low intensity conflict. To be discussed are the major components of LIC which are insurgency/counter-insurgency operations, counter/anti-terrorism, contingency operations and peacekeeping missions. Emphasis will be placed on foreign policy decisions and implications concerning the U.S. approach to LIC. *Prereq: FP210, FP230 and 300-level course.*

FP506 Honors Independent Research (3-2-4). Carrying out an independent research project based on a research design developed in FP220 (Political Science Research Methods). *Prereq: FP220 and acceptance into honors program.*

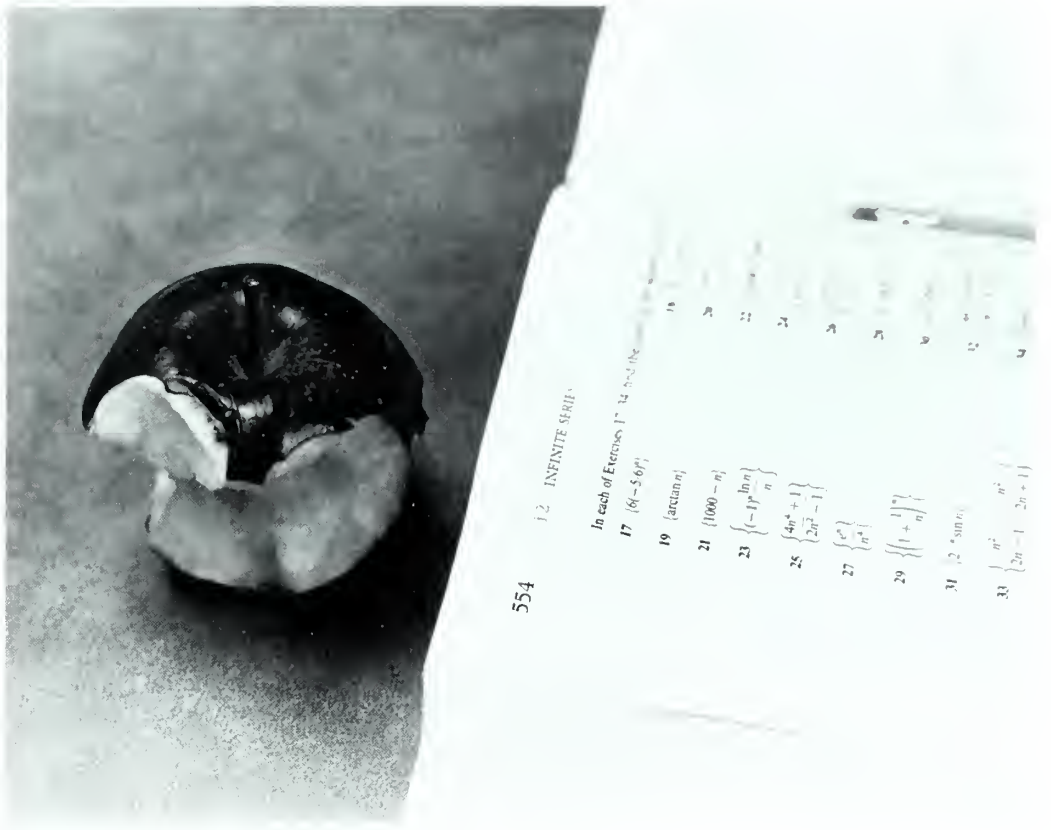
FP507 Honors Internship Research (3-2-4). Carrying out an independent research project inspired by the experiences of a summer internship. Students will draw on the research resources and personnel of their internship to develop a research paper on a relevant topic. Participation involves pre- and post-internship seminar. *Prereq: acceptance and participation in an approved summer internship and acceptance into the honors program.*

FP508 Honors NAFAC Research (2-2-3). Using their assigned topic as a Naval Academy Foreign Affairs Conference delegate, students carry out independent research which will be used as the basis for their discussions at NAFAC, but would also stand alone as significant research. *Prereq: acceptance as a NAFAC delegate and acceptance into the honors program.*

FP509 Honors Senior Seminar (3-2-4). An advanced research seminar to prepare students to begin the research that will culminate in their senior honors thesis. *Prereq: acceptance into the honors program and 1/C standing.*

FP510 Honors Senior Thesis (3-2-4). Carrying out independent research using a wide variety of data collection and analysis methods. The final paper will be presented orally and evaluated by a team of faculty members. *Prereq: acceptance into the honors program, FP509 and 1/C standing.*

"You have to be prepared to work really hard all the time. Your effort determines how well you'll do."



Division of Mathematics and Science

Department of Chemistry
Department of Computer Science
Department of Mathematics
Department of Oceanography
Department of Physics

Department of Chemistry

Chemistry Major

The chemistry major at the Naval Academy provides midshipmen with training in all of the discipline's traditional fields, leading to a bachelor of science degree certified by the American Chemical Society.

All chemistry majors take required courses in organic, inorganic, analytical and physical chemistry. In addition to the required courses, midshipmen may take advanced courses in each of these subject areas. Individual laboratory research projects enable midshipmen to investigate topics of particular interest to them under the guidance of a faculty member.

Chemistry is an experimental science, and many hours are devoted to laboratory work. The chemistry department at the Naval Academy has one of the finest undergraduate laboratories in the nation, with modern spaces and a wide array of instrumentation. Skilled technicians maintain the laboratories, assist the faculty and help midshipmen solve practical problems in the labs.

Faculty have a wealth of experience, not only in their academic understanding of chemistry but also in the practical application of chemistry in the Navy and Marine Corps. Chemistry majors will find that their civilian and military instructors can make the study of chemistry a highlight of their learning experience at the Naval Academy.

The chemistry major gives midshipmen a solid background in scientific principles required for most of the technical disciplines in which they will work as naval officers. It also provides an excellent academic base for graduate studies in such diverse fields as medicine, oceanography, operations research, management and engineering.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM221, SM230;
Science: SP211, SP212;
Humanities: HH205, HH206 and two electives;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400;
Major: SC201, SC202, SC310, SC321, SC301, SC306, SC405, SC410 and two major electives; one free elective.

Chemistry Courses

SC111 & SC112 Foundations of Chemistry (3-2-4, 3-2-4). A two-semester sequence presenting the fundamental laws and theories of chemistry. Major topics include chemical stoichiometry, periodic trends, atomic structure, chemical equilibrium, thermodynamics, nuclear chemistry, electrochemistry and kinetics. The material is presented in a lecture format complemented with experiments designed to develop the student's laboratory skills. Naval applications of chemistry are introduced throughout the courses to provide an awareness of chemistry in normal Navy operations.

SC121 & SC122 Investigations in Chemistry (3-2-4, 3-2-4). The course structure is similar to that of SC111-112, but topics are covered at a more advanced level. The laboratory portion of the course involves some investigative experiments which are similar to research projects. This sequence is designed for the student with some previous background in chemistry and a strong interest in the subject. *Prereq: permission of department chair.*

SC151 Modern Chemistry (3-2-4). A one-semester offering for the well-prepared student, satisfying the plebe year chemistry requirement. Students entering this course must have demonstrated their understanding of fundamental chemical concepts by a strong performance on the chemistry validation exam. *Prereq: permission of department chair.*

SC201 & SC202 Organic Chemistry (3-6-5, 3-6-5). The chemistry of covalent compounds of carbon, including aromatic, aliphatic and heterocyclic. The second semester laboratory includes qualitative organic analysis. Special attention is given areas of petroleum, plastics, drugs and spectroscopy. *Prereq: SC151 or SC122 or SC112.*

SB251 General Biology I (3-2-4). Fundamental principles are introduced. Topics include protoplasm, plant and animal histology, plant and animal metabolism, gametogenesis and cell division, as well as genetics, ecology and organic evolution.

SB252 General Biology II (3-2-4). Expands upon topics from General Biology I, particularly plant and animal metabolism, and introduces vertebrate morphology and physiology. *Prereq: SB251.*

SC301 Physical Chemistry (3-0-3). An introduction to the physical states of matter, kinetic theory of gases and liquids, phase equilibria, properties of solutions, atomic and molecular structure. *Prereq: SM221, SP212.*

SC306 Instrumental Methods of Analysis (3-6-5). The theory and applications of modern instrumental methods of analysis are stressed. A wide array of sophisticated instruments is available for student use. *Prereq: SC321, Coreq: SC301.*

SC310 Inorganic Chemistry (3-0-3). The chemistry of the Main Group elements is used to establish the conceptual framework of inorganic chemistry. *Prereq: SC202, Coreq: SC321.*

SC321 Quantitative Analysis (2-6-4). A study of volumetric, gravimetric, and modern optical and electrical methods of analysis. Theory and laboratory procedures and techniques are stressed. *Prereq: SC151, SC122 or SC112.*

SC405 Physical Chemistry (3-6-5) Second semester of a year-long course. Emphasizes thermodynamic aspects of physical chemistry in both laboratory and lecture. *Prereq: SC301, SC306.*

SC410 Inorganic Chemistry (3-3-4). Uses concepts of SC310 and expands to consider the chemistry of the transition metals. Laboratory emphasizes modern techniques of synthesis, purification and identification. *Prereq SC310, SC405.*

SC432 Biochemistry (3-0-3). The biological chemistry of the human body is discussed, including both normal and abnormal aspects. Metabolism, nutrition, vitamins and hormones are included. *Prereq: SC201.*

"During high school it is crucial that you take all of the highest level courses possible, even at the expense of your grade point. My cumulative quality point rate at the Naval Academy is higher than it was in high school and I am a double major. Why? Because I had the strongest possible base coming out of high school."

Department of Computer Science

Computer Science Major

The computer science major gives students a background in the main facets of computer science with an orientation toward the naval applications of computers. A designated bachelor of science degree is awarded. The program is accredited by the Computer Science Accreditation Commission of the Computing Science Accreditation Board.

The computer science department operates its own VAX 6310 and VAX 8350 minicomputers running the VMS operating system, hosting the following languages: Ada, C, Pascal, LISP, PROLOG and FORTRAN. These machines are accessed by students through one of 40 microcomputers in two laboratory classrooms or from their personal computers in their rooms via the Naval Academy Data Network. Two MicroVAX IIs support a local area network operation. Additionally, the department maintains two Sun 3 network file servers. Complementing departmental resources, Computer Services operates a Gould minicomputer running the UNIX operating system and a mainframe Honeywell DPS 8/62 system running the Dartmouth Time Sharing System. All midshipmen have accounts on these machines. Upon entry into the academy, each midshipman is issued a microcomputer with word processing and spreadsheet software and a Windows environment package.

Today's Navy and Marine Corps require junior officers with the highest levels of technical expertise and professional competence. The computer science major will be well-equipped to

meet the challenges of managing multiple computer systems and handling the rapid integration, analysis and dissemination of information generated.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM221, SM239;
Science: SP211, SP212;
Humanities: HH205, HH206 and two electives;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400;
Major: SI210, SI211, SI262, SI301, SI304, SI332, SI411, SI434, SI472, and four major electives; one free elective.

Computer Science Courses

SI171 Introduction to Computing for Engineers (3-0-3). A plebe elective in computing for midshipmen who intend to major in an engineering discipline. Course emphasis is on developing engineering problem solving skills through the use of a high level programming language or other appropriate application packages.

SI172 Fundamentals of Computing (3-0-3). A plebe elective in computing for midshipmen who want to increase their computer literacy and competency. Course emphasis is on developing technical problem solving skills through the use of a programming language.

SI173 Introduction to Computers and Computer Applications (3-0-3). A plebe elective, this course is designed for the student with no or minimal computer background. This hands-on course emphasizes computer literacy and the use of applications software such as wordprocessing, spreadsheets and communications.

SI210 Introduction to Computer Science (3-0-3). Introduction to algorithmic development, problem solving and software design. Principles and concepts to provide foundation, knowledge and experience upon which later computer science courses will build. The first course for computer science majors.

SI211 Advanced Programming (3-0-3). Machine and assembly language, compilers and interpreters. Program segmentation and linking. Macros, sub-routines and utility routines. Input/output, peripheral devices and auxiliary storage. Program efficiency and documentation.

SI262 Discrete Structures (3-0-3). An introduction to the mathematical foundations of computing through modern algebra, graph theory, set theory and propositional logic. *Preq: SI210.*

SI301 Data Structures (3-0-3). Data representation and information management. Lists, strings, arrays, trees and graphs. Storage structures, allocation and collection. Sorting techniques, symbol tables and searching. *Prereq: SI210.*

SI304 Programming Languages (3-0-3). A study of formal language specification. Topics include data typing, program structure, sequencing, recursion, storage management, file interfacing and translation and syntax. The implementation of features like run time stacks, environmental tables, and parameter transmission are discussed in detail. *Prereq: SI301, SI262.*

SI305 Applied Algorithmic Processes (3-0-3). Use of top-down design and software engineering methodology to develop structured algorithms for problem-solving. A high-level language, such as FORTRAN or Ada, is used to implement the algorithmic designs.

SI310 Computer Graphics (2-2-3). Presents the concepts, theories and algorithms related to computer graphics. Builds understanding in evaluating and implementing graphical support in various application settings. *Prereq: SI211.*

SI332 Introduction to Computer Architecture (3-0-3). Organization, logic design and components of digital computing systems. Overall organization of modules into a system. *Prereq: SI211, Coreq: EE312.*

SI411 Operating Systems (3-0-3). The study of the operating system as a resource manager. Topics include process management, interrupt processing, memory management, deadlock handling, file systems, multiprogramming, multiprocessing and data security and protection. *Prereq: SI332.*

SI412 Compiler Construction (3-0-3). Using formal programming language theory as a foundation, the issues of automated theory, program optimization and language translation are examined. Sections of actual compilers are constructed to study the practical application of theory presented. *Prereq: SI211, SI301.*

"Time management is a life or death skill."

SI420 Artificial Intelligence (3-0-3). A study of the fundamental concepts and techniques in the design and implementation of functionally intelligent machines. Topics include problem-solving using state-space search, problem-reduction techniques, game trees, general problem solver; and knowledge representation using production systems, first-order predicate calculus and natural language. *Prereq: SI301, SI262.*

SI421 Discrete Simulation (3-0-3). Simulation and modeling of discrete systems. Introduction to queuing theory and stochastic processes. Comparison of simulation languages. Design, analysis and validation of simulation models. *Prereq: SI304 and SM239.*

SI430 Fundamentals of Microcomputer Systems (2-2-3). Analysis and design of software systems for micro-processors. Includes characteristics and organization of microprocessors, peripheral interface software and applications of software design. *Prereq: SI332.*

SI434 Software Engineering (3-0-3). An introduction to the latest trends in software engineering, information hiding, program specification, design requirements and reliability. Department of Defense rules for procurement of hardware and software. *Prereq: SI304.*

SI440 Database Organization (3-0-3). Topics include database systems architecture, the various approaches to database organization including relational, hierarchical and network models; normalization and implementation issues. *Prereq: SI301, SI262.*

SI451 Real Time Processing (3-0-3). Presents the topics and concepts necessary to design and manipulate interactive and real time computer and control systems. Introduces advanced concepts in processor interrupt control, multi-tasking and concurrency. *Prereq: SI332, SM239.*

SI452 Advanced Computer Architecture (3-0-3). This course provides an advanced study of the design and building principles used to create computer systems. *Prereq: SI332.*

SI454 Computer Networks (3-0-3). The course presents major topics in the area of computer networks. It views a computer network as a group of related layers or abstract machines as exemplified by the International Standards Organization (ISO) network reference model. *Prereq: SI332.*

SI472 Theory of Computing (3-0-3). Presents concepts and theories related to complexity of algorithms. Illustrates the application of complexity theory to determine the relative efficiency of algorithms. *Prereq: SI301, SI262.*

Department of Mathematics

Mathematics Major

The major in mathematics gives students the opportunity to acquire a sound mathematical foundation and to develop facility in applying mathematical concepts and techniques. The program permits concentration in mathematics, operations analysis or scientific computing. A bachelor of science degree in mathematics is awarded. An honors program with a designated honors degree is available for selected students.

A solid background in mathematics facilitates postgraduate specialization in many technical areas, including nuclear power. Mathematics provides the broad foundation for the development of analytical skills required to work with and develop new technology.

The mathematics department is the largest academic department at the Naval Academy. Each semester about two-thirds of all midshipmen take one or more courses in mathematics. Courses are taught in sections with 20-22 students in lower level courses and 15-18 students in upper level courses. Because of the department's size, there is a wide variety of elective courses to satisfy individual interests or major requirements.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Science: SP211, SP212;

Humanities: HH205, HH206 and two electives;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400;
Major: SM261, SM239, SM291, SM331, SM332, SM362, SM364, SM339, plus four major electives; one free elective.

General Science Major

The major in general science gives students the opportunity to pursue a broad, scientifically-oriented program in the field of physical applications of mathematics and science. The major permits midshipmen to experience an interdisciplinary technical course without the need for specialization. A bachelor of science degree is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302,NN200, NS310, NS401;
Mathematics: SM212, SM221;
Science: SP211, SP212;
Humanities: HH205, HH206 and two electives;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400;
Major: HP340, SA302, SB251, SI210, SM230, SO231, SO342, SP301, SP411 and two math/science/engineering electives; one free elective.

Mathematics Courses

SM005 Pre-Calculus Mathematics (4-0-4). Basic review of algebraic and arithmetic operations, analysis of functions and their graphs, and trigonometry. This course does not fulfill any of the requirements of any major and may be required in addition to stated graduation requirements for certain midshipmen. *Prereq: permission of department chair.*

SM100 Introduction to Analytic Geometry and Calculus I with Trigonometry (5-0-5). Same as SM121 plus trigonometry.

SM121 & SM122 Introduction to Analytic Geometry and Calculus I & II (4-0-4, 4-0-4). Plane analytic geometry; differential and integral calculus of one real variable; infinite series.

SM131 Calculus I (3-0-3). Same as SM121 for students with prior differential calculus experience.

SM161 & SM162 Calculus with Computers I & II (5-0-5, 5-0-5). Programming using Pascal, algorithmic development of the integral and differential calculus of one real variable. *Prereq: permission of department chair.*

SM212 Differential Equations (4-0-4). Linear and simultaneous differential equations; solution by Laplace transform and series; partial differential equations and Fourier series. *Prereq: SM221 or SM241.*

SM219 Statistics and Probability (3-0-3). Nature of statistical methods, description of data, probability, distributions, sampling, estimation, testing hypothesis, correlation and regression. Computer methods emphasized. Credit cannot be given for SM219 if credit has been given for SM239. *Prereq: SM122 or SM162.*

SM221 Calculus III (4-0-4). Differential and integral calculus of several real variables; vector analysis including integral theorems. *Prereq: SM122.*

SM222 Differential Equations with Matrices (4-0-4). A more rigorous treatment of material from SM212, the course uses basic ideas from linear algebra. Intended for mathematics majors. *Prereq: SM221 or SM241; coreq: SM261.*

SM230 Introduction to Probability and Statistics (3-0-3). An elementary treatment of the basic concepts of probability models and statistical inference. Sample spaces, discrete and continuous random variables, standard distributions, central limit theorem, sampling, statistical inference. Credit cannot be given for SM230 if credit has been given for SM239. *Prereq: SM122 or SM162.*

SM239 Probability and Statistics I (3-0-3). A more rigorous treatment of material in SM230 for advanced work in mathematics, operations research, science and engineering. *Prereq: SM221 or SM241.*

SM241 Calculus with Computers III (4-0-4). Course content includes and extends that of SM221 with extensive computer applications. *Prereq: SM162.*

SM242 Discrete Mathematics (3-0-3). Introduction to combinatorial analysis and graph

theory. Applications to problems in enumeration, matching, network analysis, optimization, scheduling, searching and sorting. *Prereq: SM122 or SM162.*

SM259 Mathematical Logic (3-0-3). Mathematical languages, formal logic, propositional calculus and truth tables, first order predicate calculus, proof theory, axiomatic systems and model theory. Applications to logical networks and nonstandard analysis. *Prereq: SM122 or SM162.*

SM261 Matrix Theory (3-0-3). Matrices, transformations, linear equations, vector spaces, characteristic matrix, eigenvalues, orthogonality. *Prereq: SM122 or SM162.*

SM264 Introduction to Numericai Analysis (3-0-3). Polynomial approximations, iterative methods for solving equations, systems of linear equations, numerical integration, interpolation, curve fitting. Computer methods emphasized. *Prereq: SM122 or SM162; SI171 or SI172.*

SM270 Introduction to Mathematical Economics (3-0-3). Equilibrium analysis, models, theory of the multiplier, acceleration principle, optimization, and linear differential and difference equations. *Prereq: SM261.*

SM271 Linear Programming (3-0-3). Simplex and dual simplex methods, minimax theorem, transportation problems and game theory. *Prereq: SM122 or SM162.*

SM281 Vector Analysis (3-0-3). Vector algebra, vector calculus, fields, line and surface integrals, Stokes and Gauss theorems. *Prereq: SM221 or SM241.*

SM291 Fundamentals of Mathematics I (2-2-3). Introduction to mathematical reasoning and the written and oral presentation of mathematical concepts, theory, and application of sets, relations, matrices, vector spaces and subspaces. *Prereq: SM122 or SM162.*

SM292 Fundamentals of Mathematics II (2-2-3). Continuation of SM291. Mathematical reasoning with emphasis on presentation of theorems. Introduction to proof technique. Theory and application of functions, linear transformations, inner product spaces, eigenvalues and eigenvectors. *Prereq: SM291.*

SM311 Engineering Mathematics I (3-0-3). Vector analysis, Fourier analysis, partial differential equations, Sturm-Liouville problems, Legendre polynomials, determinants and matrices. *Prereq: SM212 or SM222.*

SM312 Engineering Mathematics II (3-0-3). Laplace and Fourier transforms, selected topics from complex variables. *Prereq: SM212 or SM222.*

SM315 Introduction to Partial Differential Equations (3-0-3). Linear equations, Cauchy problems, Laplace and Poisson equations, boundary value problems, heat equations. Sturm-Liouville problems and orthonormal expansions. *Prereq: SM212 or SM222.*

SM331 Advanced Calculus I (4-0-4). Logic, induction, sequences, limits, real numbers, series, continuity, differentiability. *Prereq: SM261, SM291.*

SM332 Advanced Calculus II (4-0-4). Continuation of SM331. Properties of continuous functions, the Riemann Integral, power series, n-dimensions. *Prereq: SM331.*

SM331H and SM332H Real Analysis I and II (4-0-4, 4-0-4). Honors versions of SM331 and SM332. *Prereq: Permission of math department honors committee.*

SM339 Applied Statistics I (3-0-3). An applied study of a variety of statistical methods used in obtaining, presenting, summarizing and analyzing statistical information. Included are strategies for data collection and presentation, and techniques of statistical inference for population, parameters based on the concepts of sampling, probability and distribution theory. *Prereq: SM239.*

SM362 Modern Algebra (3-0-3). Integers, groups, mappings, rings, fields. *Prereq: SM261, SM291.*

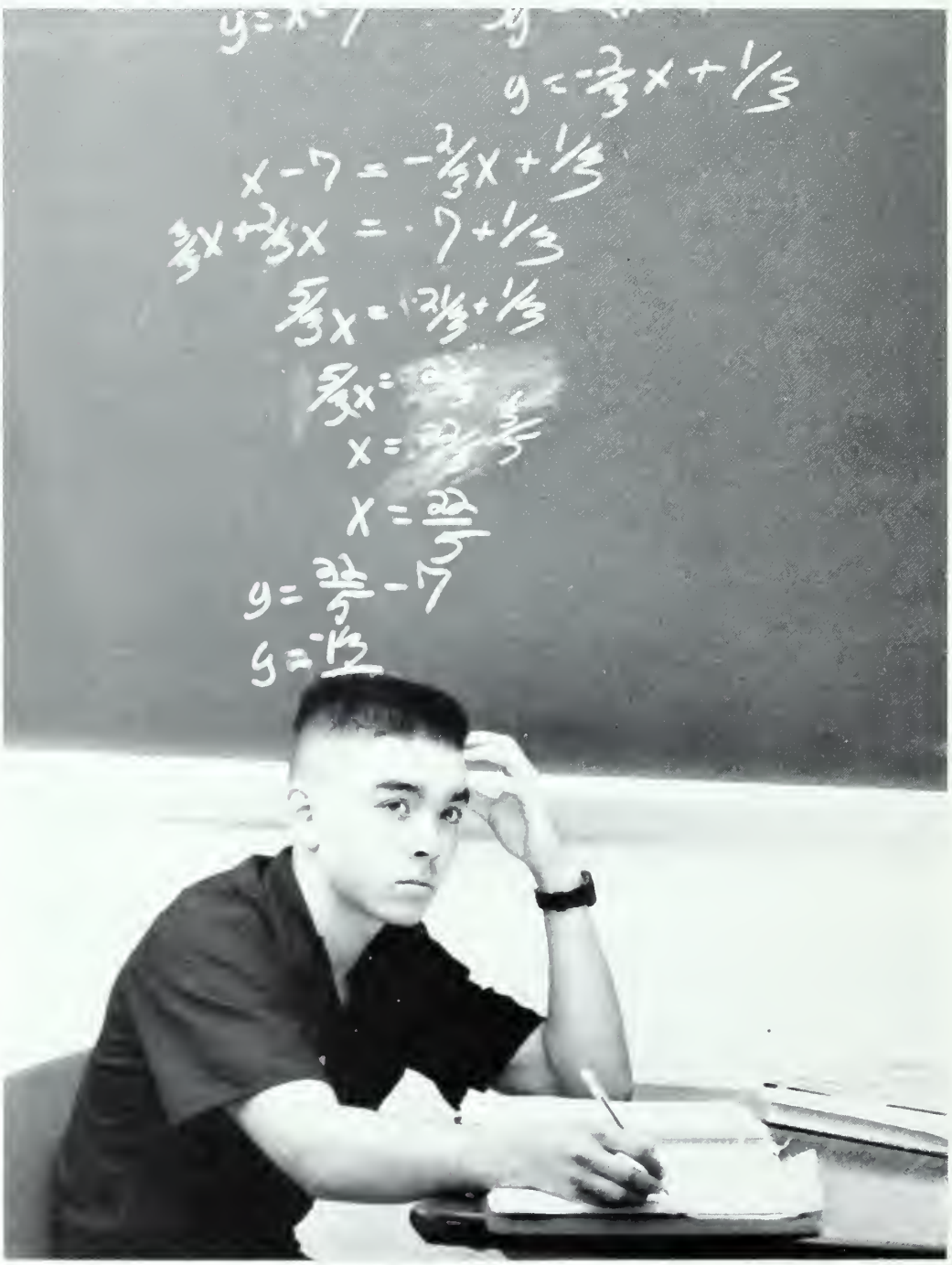
SM364 Introduction to Scientific Computing (3-0-3). Computer arithmetic and errors, algorithms and programs for iterative solution of equations, linear systems, function approximations, numeric integration, ordinary differential equations, use of scientific software libraries. *Prereq: SM212 (or SM222); SM261 (or SM311).*

SM411 Introduction to Complex Variables (3-0-3). Algebra and topology of complex numbers. Elementary functions. Complex derivative and integral. Theorems of Cauchy. Analytic functions, conformal nappings, Taylor and Laurent series, singularities, residue theory, analytic continuation. Applications to real analysis and physical problems. *Prereq: SM331.*

SM425 Advanced Numerical Analysis (3-0-3). Numerical solution of equations in one and several variables, direct and iterative algorithms, rate of convergence. Computer methods emphasized. *Prereq: SM331 or permission of instructor.*

SM426 Numerical Methods for Differential Equations (3-0-3). Interpolation and polynomial approximation, numerical integration and differentiation, numerical algorithms for initial value, and boundary value problems. *Prereq: SM212 or SM222, SM331 or permission of chair.*

SM433 Methods of Applied Mathematics (3-0-3). A course of selected topics in applicable mathematics built upon students' prior studies in linear algebra (SM261) and analysis (SM331). A few topics are chosen from such subjects as linear operator theory, calculus of variations, integral equations, transform methods, tensor calculus and distribution theory. Areas of application include physics, engineering, systems engineering and operations analysis. *Prereq: SM331 or permission of chair.*



"Calculus will sneak up and bite you."

SM461 Linear Algebra (3-0-3). Vector spaces, linear transformations, Jordan canonical form, inner product spaces. *Prereq: SM261, SM331.*

SM462 Algebraic Structures (3-0-3). Groups, rings, fields, Galois theory. *Prereq: SM362, SM331.*

SM464 Topology (3-0-3). A mathematical analysis of such surfaces as the sphere, torus, Klein bottle and Mobius strip. To develop an intuitive feel for the subject, a visual approach is used and many examples are investigated. *Coreq: SM332.*

SM465 Advanced Differential Equations (3-0-3). Existence and uniqueness of solutions to ordinary differential equations. Stability, oscillation, dynamical systems. *Coreq: SM332.*

Operations Analysis Courses

SA302 Analysis of Naval Tactics (3-2-4). An introduction to the techniques of modeling and quantitative analysis applied to specific naval operational problems, including search and patrol, screening, anti-air warfare, mining, equipment reliability and decision rules. *Prereq: SM239 or SM230.*

SA367 Introduction to Mathematical Modeling (3-0-3). Realistic problems, often of military interest, are formulated mathematically and solved using techniques from probability, statistics, calculus, and differential equations. The analysis is carried out by students working in small teams and individually. Solutions are presented in oral nontechnical briefings and in written technical reports. *Prereq: SM239 or SM222 or SM212.*

SA401 Linear Models and Optimization (3-0-3). Investigation of fundamentals of linear optimization subject to constraints, including construction and analysis of linear programming and network problems. *Prereq: SM261.*

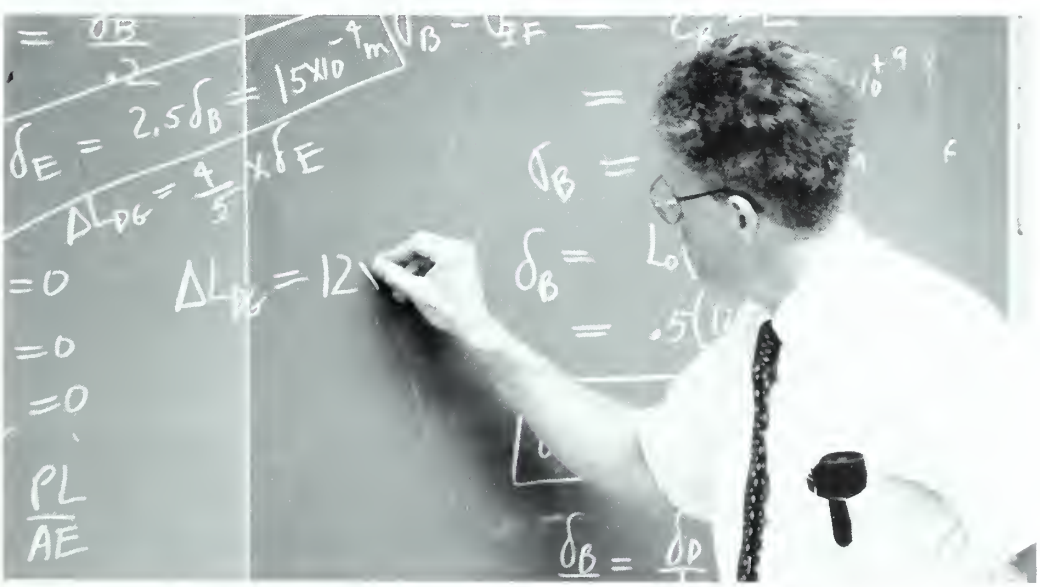
SA402 Dynamic and Stochastic Models (3-0-3). Investigation of quantitative analysis of decision options, including PERT/CPM, dynamic programming, Markov chains and queuing theory. Applications to typical operations are stressed. *Prereq: SM239, SM261.*

SA410 Applications of Search and Detection Theory (3-0-3). Application of probability and deterministic models to analysis of operational problems. *Prereq: SM230 or SM239.*

SA412 Projects in Operations Analysis (2-2-3). Operations research techniques are applied using student projects, case studies and visiting lecturers. Topics include current military and industrial problems. *Prereq: permission of chair.*

SA430 Logistics (3-0-3). Investigates techniques of operations analysis applicable to the solution of problems in reliability, maintainability, availability and inventory. *Prereq: SM239 and SA401.*

SA442 Applied Statistics II (3-0-3). A continuation of SM339 that includes examination, evaluation and application of advanced statistical methods. Techniques studied include sampling, nonparametric analysis, simple and multiple regression, correlation, analysis of variance and decision theory. *Prereq: SM339.*



"Study very hard at chemistry and calculus. They will be among the hardest challenges you face here."

Department of Oceanography

Oceanography Major

The oceanography major is designed to give future naval officers practical and theoretical knowledge of the ocean environment and to build a sound academic foundation for future graduate study in any technical discipline. An interdisciplinary science major, oceanography involves the study of meteorology, geophysics, physics, chemistry, biology and geology as they relate to the effects of ocean environment on naval operations. Basic courses in these areas are prerequisites for more advanced oceanography and meteorology courses required by the major or available electives. Students take courses in geophysical fluid dynamics, sound propagation in the ocean, the study of waves and tides and the use of satellites in oceanography. Courses in advanced biological oceanography offer a glimpse of the undersea world and its marine creatures; synoptic meteorology courses involve hands-on weather forecasting experience using the latest tools available.

More than 25 percent of the required course load is within the oceanography specialty. Other courses include advanced mathematics, a tool by which oceanographers describe the complex behavior of the fluid environment in which they work.

The Naval Academy boasts the most extensive undergraduate oceanographic facilities in the country. Located on the mouth of the Severn River, the Hendrix Oceanography Laboratory is a multi-function enclosure featuring a wet laboratory where students interact with the world's largest estuary, the Chesapeake Bay. The academy's research vessel enables midshipmen to collect samples and oceanographic data afloat and deliver them to Hendrix Lab. Another laboratory complex in Rickover Hall houses the geological, biological, chemical, general oceanographic and remote sensing laboratories. The meteorological laboratory has an on-line receiver to display charts from the National Oceanic and Atmospheric Administration, direct access to the World Meteorological Organization's data network, a color weather radar, and a high resolution satellite receiver, all of which can be accessed via computer workstations. Students use all of these facilities in required courses as well as in their electives.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM212, SM221, SM311;
Science: SP211, SP212, SP328, SP411;
Humanities: HH205, HH206 and two electives;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400
Major: SO231, SO232, SO344, SO345, SO414, SO416, plus three major electives; one free elective.

Oceanography Courses

SO221 Introduction to Oceanography (3-0-3). A descriptive course designed for the ocean engineering major to provide an overview of significant oceanographic factors and their impact on engineering applications. *Prereq: SC104, SC106, or SC114; SP211; SM201 or SM211.*

SO261 Physical Geology (3-2-4). A study of the dynamic Earth, centered around the concept of global plate tectonics, with emphasis on the materials, form and structure, and particularly the internal and external processes that shape the Earth and affect its inhabitants.

SO231 General Oceanography I: Physical (3-2-4). Beginning physical oceanography, the ocean basins, age and origins of oceans, physical properties of sea water, distribution of variables and physical characteristics of estuaries. Ocean current systems, water masses, motion-producing forces, heat budget, heat distribution and thermal structure, waves, and tides. Laboratory work includes a fall survey of changing oceanographic parameters in the Chesapeake Bay. *Prereq: SC111, oceanography major.*

SO232 General Oceanography II: Biological, Geological and Chemical (3-2-4). Continuation of introductory physical oceanography, with emphasis on the interactions of physical processes in the oceans with geology, biology and chemistry. Sediment distribution, characteristics, classification and sedimentation processes; marine volcanism and diagenesis; chemical properties of sea water, marine cycles and distribution of nutrients and gases in the oceans; marine productivity, diversity and the strategies employed by marine organisms. *Prereq: SO231*

SO342 Introduction to Meteorology (3-2-4). An introductory course designed for general science majors, as well as those interested in taking some of the advanced meteorological electives. This course treats the basic meteorological variables and instruments used for atmospheric measurements, physical processes governing the sun-earth-atmosphere thermal system, basic atmospheric thermodynamics, the chemical and temperature structure of earth's atmosphere, cloud and precipitation physical processes, basic atmospheric circulations and accompanying weather and climatic patterns. This course uses thermodynamic diagrams for analyzing vertical profiles of atmospheric variables, as well as conventional and remotely sensed data to analyze horizontal distributions of meteorological fields. *Prereq: SM121*

SO344 Basic Atmospheric Processes (2-2-3). An introductory course designed for oceanography and general science majors, as well as those interested in taking some of the advanced meteorological electives. This course treats the basic meteorological variables and instruments used for atmospheric measurements, physical processes governing the sun-earth-atmosphere thermal system, the chemical and temperature structure of earth's atmosphere, cloud and precipitation physical processes, basic atmospheric circulations and accompanying weather and climatic patterns, as well as an introduction to common meteorological data products used in weather analysis and prediction. *Prereq: SM201 or SM211, and SP211.*

SO345 Atmospheric Thermodynamics and Kinematics (3-2-4). A study of the thermodynamic and kinematic properties of the atmosphere, including the effects of temperature, moisture and wind processes. Introduces the forces responsible for atmospheric motions. This course uses thermodynamic diagrams for analyzing vertical profiles of atmospheric variables, as well as conventional and remotely-sensed data to analyze horizontal distributions of meteorological fields. *Prereq: SM212, SP211 and SO344 or permission of instructor.*

SO345H Honors Atmospheric Thermodynamics and Kinematics (3-2-4). A study of the thermodynamic and kinematic properties of the atmosphere, including the effects of temperature, moisture and wind processes. Introduces the forces responsible for atmospheric motions. This course uses thermodynamic diagrams for analyzing vertical profiles of atmospheric variables, as well as conventional and remotely-sensed data to analyze horizontal distributions of meteorological fields. Laboratory exercises will make extensive use of the Metlab computer system and applications software for meteorology. *Prereq: SM212, SP211 and SO344 or permission of instructor.*

SO415 Oceanic and Atmospheric Processes (3-2-4). Development of the fundamental equations of motion governing the dynamics of quasi-horizontal, inviscid and viscous fluid flow on the rotating earth. Scale analysis of the basic hydrodynamic equations are used to identify forces responsible for motions of interest. Basic numerical modeling techniques for both oceanic and atmospheric processes are introduced. *Prereq: SO345, SM311 and SP328.*

SO416 Waves and Tides (2-2-3) The dynamics of surface, internal, and capillary waves. Wave statistics and spectrum. Principles of wave forecasting. Tide generating forces; Tidal prediction. Seiches, bores and surges. *Prereq: SO415.*

SO422 Nearshore Oceanography (2-2-3). Examines the oceanographic regime from the continental shelf break to the intertidal zone and coastal dunes. Concentrates on shallow water wave, surf and beach processes. Includes a discussion of coastal management and engineering procedures. *Prereq: SO231.*

SO425 Oceanography from Space (3-0-3). An overview is given of the various platforms and sensors currently in use and planned. The electromagnetic spectrum and radiation laws are explained. Applications exercises give "hands-on" experience with image processing systems. *Prereq: SO232, SO344.*

SO441 Synoptic Meteorology (2-2-3). A practical course in meteorological analysis and forecasting as applied to operational planning. This course utilizes a variety of meteorological datastreams available in the computerized Meteorology Laboratory to analyze and predict the current and future state of the atmosphere. *Prereq: S0342 or SO344.*

SO442 Tropical Meteorology (2-2-3). A study of the special processes affecting meteorological analysis and forecasting in the tropics, including satellite imagery analysis, with particular emphasis on hurricane or typhoon prediction, creation, movement and decay. *Prereq: SO342 or SO344.*

SO444 Climatology (3-0-3). A climatic approach to meteorological phenomena. *Prereq: SO342 or SO344.*

SO445 Air-Sea Interaction (2-2-3). Develops an understanding of the mass and energy transfer processes between the ocean and the atmosphere, and how these processes affect the vertical wind profile. Lab work involves reducing and analyzing boundary layer measurements. *Prereq: SO231, SP328, SO345.*

SO451 Biological Oceanography (2-2-3). An introduction to the ocean as a biological environment. Laboratory work includes practical studies of the biology of the Chesapeake Bay. *Prereq: SO221, SO232 or permission of the instructor.*

SO452 Applied Biological Oceanography (2-2-3). A study of the biological phenomena which affect naval operations. Significant biological and chemical processes are analyzed in the laboratory. *Prereq: SO451.*

SO461 Geological Oceanography (2-2-3). Introduction to marine geological/geophysical instrumentation, theory, data collection, analysis, interpretation and applications. Geomorphology, structure, petrology, sedimentation, stratigraphy, origin and development of ocean basins and margins are examined in light of theory of plate tectonics. Practical studies of the Chesapeake Bay are part of the laboratory work. *Prereq: SO231, SO232.*

SO463 Polar Oceanography (3-0-3). A descriptive course which begins with the history of polar exploration. The physical oceanography of the polar areas is explained with particular emphasis on the role of sea ice. Case studies include reviewing recent ONR-sponsored field programs.

SO471 Chemical Oceanography (2-2-3). The modern approach to the ocean as a chemical system. Laboratory instruction emphasizes principles with appropriate methods. Classical concepts are discussed, as well as newer trends. *Prereq: SO221, SO232.*

SO472 Environment Applications and Issues (2-2-3). A capstone course for oceanography majors. This course focuses on fundamental technical issues created by regional environments, assesses the impact of the environment on operational systems, and exposes the student to issues of national management policy with an environmental aspect or impact. Guest lecturers. *Prereq: 1/C oceanography major.*

SO486A Concepts in Hydrography (3-0-3). Offers a general presentation of the fundamentals of hydrographic surveying. Course objectives are familiarization of the student with the elements of hydrography including geodesy, precise positioning afloat, depth measurement, tidal observations and shoreline mapping. The course will include practical demonstrations of hydrographic surveying methods. *Prereq: SO221, SO231 or permission of the instructor.*

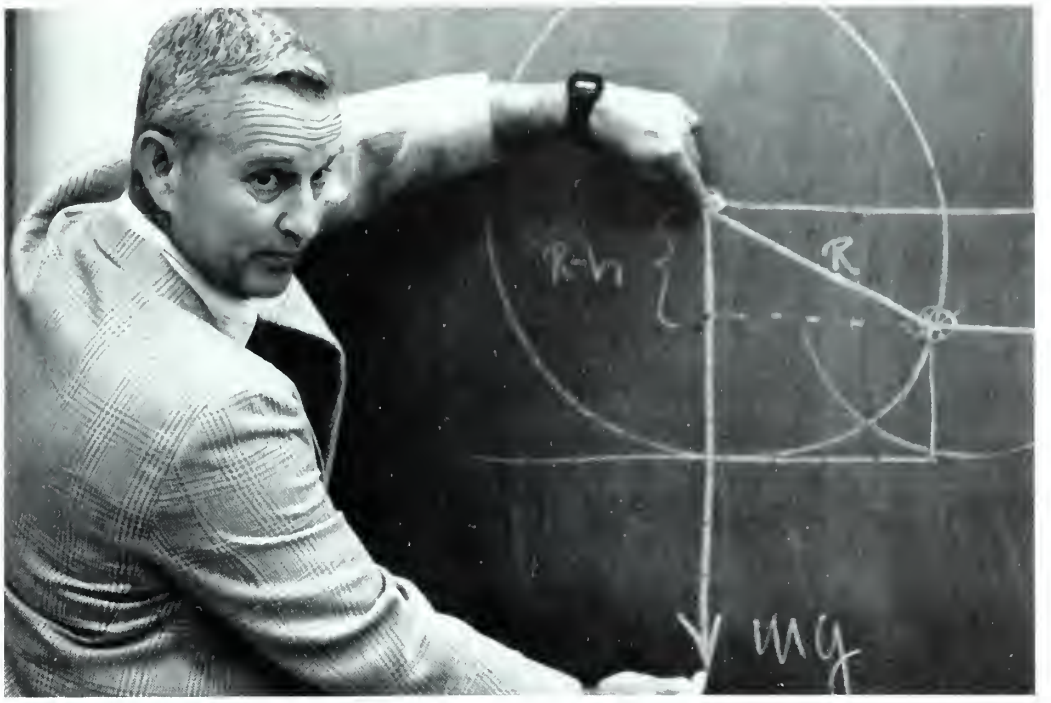
O486B Remote Sensing of Ocean Currents (3-0-3). Satellite oceanography. Ocean current systems around the world are examined using visible and infrared scanning radiometers as well as altimeters. Phenomena such as El Nino, the Charleston "Bump," equatorial longwaves and mesoscale eddies are investigated in detail allowing work on department's image processing system. Guest speakers and field trips are featured. *Prereq: SO221 or SO231 or permission of instructor.*

SO503 Honors Modern Methods in Oceanography and Meteorology (2-2-3). Statistical methods and techniques applied to research topics, oceanographic and laboratory instrumentation, remote sensing, and mathematical modeling. Prepares students to undertake independent research in oceanography or meteorology. *Prereq: oceanography honors program or permission of department chair.*

SO505 Honors Independent Research (0-6-3). Independent research in oceanography or meteorology on a subject of the student's choice, culminating in a written report and a presentation to the faculty. *Prereq: SO231.*

SO513 Honors Oceanic and Atmospheric Processes (3-2-4). Development of the fundamental equations governing the dynamics of fluid flow on a rotating Earth. Scale analysis leading to geostrophic, gradient, cyclostrophic and inertial flow. The role of friction. The ergodic hypothesis; Reynold's stresses. Boundary layers and Ekman flow. The wind driven ocean circulation. Vorticity; the circulation theorem. Basic concepts of numerical modeling. *Prereq: SP328, SM311, SO23l, S0345H.*

SO524 Honors Waves and Tides (2-2-3). The dynamics of surface waves. Linear gravity wave theory; Stokes second order theory. Internal and capillary waves. Wave statistics and spectrum. Principles of wave forecasting. Tide generating forces. Equilibrium theory. Harmonic analysis; Tidal prediction. Seiches, bores and surges. *Prereq: SO513*



Department of Physics

Physics Major

The major program in physics presents fundamental physical concepts and principles in such a way as to emphasize their general usefulness and provides a strong foundation for further work in a broad range of technical fields. The challenge of physics lies in uniting its laws and definitions, expressed through algebra, trigonometry and calculus, with the integrative reasoning so essential to solving new problems. A bachelor of science degree is awarded.

Some of the topics treated in the sequence of courses are the origin, propagation and reception of waves of all kinds; field concepts; theory of relativity; basic theory of quantum mechanics; and statistical mechanics. All are studied with the object of developing an open-minded and creative approach to the physical world -- an approach increasingly important to those who will be the leaders in the Navy of the future. The physics major is excellent preparation for midshipmen interested in nuclear power, Navy air, surface warfare and Marine Corps warfare specialties. Advanced degree programs are available to qualified physics majors prior to graduation, immediately after graduation and later in their careers.

The Physics Department houses eight teaching laboratories which include special facilities in acoustics, nuclear physics, laser optics and solid state physics. There are also seven faculty research laboratories, two photographic darkrooms and well-equipped machine and electronics shops. Major instruments include a 1.7-megavolt tandem electrostatic accelerator, a 7-inch equatorially mounted refracting telescope, modern laser systems, an anechoic chamber, electron spin resonance and nuclear magnetic resonance facilities, high resolution visible light and infrared spectrographs, a liquid helium dilution refrigerator, an x-ray diffractrometer and microcomputer workstations for student use in data collection and processing in all laboratories. Several more workstations are available in a physics majors' study room for midshipmen to use for graphics, word processing and mathematical analysis.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NL202, NL302, NN200, NS310, NS401;
Mathematics: SM212, SM221, SM311;
Science: SP221, SP222, SP226;
Humanities: HH205, HH206 and two electives;
Engineering: EE311, EE312, EN200, EN300, ES300, ES400 and one math/science/engineering elective
Major: SP324, SP327, SP333, SP342, SP425, SP444, plus two physics electives; one free elective.

Physics Courses

SP211 & SP212 General Physics I & II (3-2-4, 3-2-4). These courses emphasize the fundamental principles of classical physics; however, contemporary applications are introduced as appropriate. The topics covered are mechanics, electricity, magnetism, wave motion, sound and light. *Prereq: Calculus I for SP211; SP211 or SP221 for SP212.*

SP221 Physical Mechanics I (3-2-4). The first course in physics for majors in physics. This course provides the basic classical mechanics for further study in physics. *Prereq: SM121 or approval of department chairman.*

SP222 Electricity and Magnetism I (3-2-4). A first course in electricity and magnetism with emphasis on the concepts of fields and potential. The course culminates in the formulation of Maxwell's equations. *Prereq: SP221 or SP211.*

SP226 Heat, Sound and Light (3-2-4). Develops the basic concepts in heat, sound, and light. This course completes the three-course sequence in physics, SP221, SP222 and SP226. *Prereq: SP211 or SP221.*

SP301 Modern Physics (3-0-3). An introduction to relativistic mechanics and the particle aspects of electromagnetic radiation. Emphasis on the decay of unstable nuclei and nuclear reactions. *Prereq: SP212 or SP226.*

SP310 Astronomy (3-0-3). The fundamentals of astronomy as a physical and mathematical science, covering the solar system, stellar and galactic astronomy and cosmology. *Prereq: SP212 or SP226.*

SP324 Physics of the Atom I (3-2-4). The development of the wave mechanics of Schrodinger, its probabilistic interpretation, and its application to problems of barrier penetration, the harmonic oscillator and the structure of the atom. *Prereq: SP327, SP333, SM212; Coreq: SM311 or permission of the instructor.*

SP327 Twentieth Century Physics (3-0-3). A comprehensive study of the development of physics in the current century, with particular attention being given to relativity theory, quantum theory, atomic structure and modern particle physics. *Prereq: SP222 and SP226.*

SP328 Fluid Physics (3-0-3). A first course in classical fluid mechanics which addresses the fundamentals of inviscid, incompressible flow dynamics, circulation, vorticity and turbulent flow. *Prereq: SP212 and SO311 or permission of department chair.*

SP333 Physical Mechanics II (4-0-4). A first course in physical mechanics at the intermediate level. Newtonian and Lagrangian mechanics with special emphasis on the central force problem and noninertial reference frames. *Prereq: SP221 or SP211; SM212.*

SP342 Electricity and Magnetism II (4-0-4). A course in electromagnetic theory required for all majors in physics and electrical engineering. Maxwell's equations are formulated in the notation of vector analysis and applied to various situations. *Prereq: SP222; Coreq: SM311.*

SP411 Underwater Acoustics and Sonar (3-0-3). A fundamental study of sound propagation in the ocean environment as it relates to the design and operation of sonar. *Prereq: SP212 or SP226.*

SP425 Physics of the Atom II (3-2-4). The formalism of quantum mechanics. Quantum theory of angular momentum; application to specific heats of gases, hydrogenic atoms. Quantum treatment of multi-electron atoms; applications to atomic and molecular spectra, solids, quantum statistics. *Prereq: SP324, SM311.*

SP434 Nuclear Physics (3-2-4). A study of the basic static and dynamic properties of the nucleus and of the interaction of particles and radiation with matter. Emphasis on the experimental techniques. Where appropriate, quantum mechanical interpretations of the phenomena are given. *Prereq: SP425.*

SP436 Acoustics (3-2-4). An introduction to modern boundary-value problems; discrete Fourier transform; radiation, transmission, and detection of sound waves; electro-acoustics; physcho-acoustics, architectural acoustics and underwater acoustics. *Prereq: SP212 or SP226 and SM212.*

SP438 Optics (3-2-4). An introduction to modern optics. The topics included are polarization, interference, coherence, diffraction, Fourier transforms, holography, optics of solids and basic laser physics. *Prereq: SP342.*

SP442 Solid State Physics (3-2-4). An introductory course in physics of the solid

model, band theory, magnetism and semiconductors. *Prereq: SP324.*

SP444 Thermal Physics (3-0-3). A presentation of topics in thermal physics from the statistical viewpoint. *Prereq: SP425 or permission of the department chair.*

SP445 Stellar Astrophysics (3-0-3). A study of basic physics of stellar properties or processes: mass, luminosity, stellar spectra, chemical composition, stellar energy sources, nucleosynthesis, stellar models and stellar evolution. *Prereq: SM212, SP301 or SP324; SP310 or permission of instructor.*

"Academics here are tough; don't let anyone tell you differently. They are not impossible, however, and learning to balance the academic demands against physical, professional and social demands is part of the education process unique to the academy."

Division of Professional Development

The Division of Professional Development prepares midshipmen to be professional officers in the naval service. The courses offered by its academic departments, leadership and law and seamanship and navigation, develop skills in the classroom environment including extensive laboratory time on the water in yard patrol training craft and in the academy's tactical training facilities. Through the other two professional development departments, professional programs and sail training, each midshipman moves out of the classroom to experience actual life in the Navy and in the Marine Corps -- at sea, in the air, and on the ground. The newest department, the Department of Technical Programs, provides computer and audio-visual support via the computer classroom to enhance the midshipmen's learning experiences. In short, the primary goal of the division is to "prepare midshipmen to excel in the fleet."

Department of Leadership and Law
Department of Professional Programs
Department of Sailing
Department of Technical Programs
Department of Seamanship and Navigation

Department of Leadership and Law

The department of leadership and law presents a core of required courses, as well as electives in leadership and psychology. All have the common objective of preparing midshipmen to lead as officers by providing the necessary principles and practical information to develop effective, personal leadership styles. Leadership courses are the cornerstone of the department, focusing on developing leadership practices consistent with the highest standards of professional ethics to enhance mission accomplishment and provide for high unit morale. The core courses also arm future junior officers with the practical legal information they will need in the fleet regarding discipline and military justice, law and the law of armed conflict. Psychology elective courses are designed to help midshipmen learn and understand what motivates others and themselves.

Leadership and Law Courses

All midshipmen, regardless of major, must complete the following courses:

NL102 Fundamentals of Naval Leadership (2-0-2). An introductory course to instill in midshipmen a professional sense of purpose, personal honor and ethics. Military leadership traits and techniques which involve the communication of ideas and the action of command are explored.

NL202 Developing Subordinates (2-0-2) This course introduces the principles of Total Quality Leadership (TQL) and applies them to a major brigade issue. Midshipmen are encouraged to apply TQL in subordinate development through counseling techniques and principle-centered leadership.

NL302 Ethics and Leadership Applications for the Naval Officer (2-0-2). This leadership core course provides a practical study in professional ethics and applied leadership principles. Comprehensive case study analysis allows the midshipmen to formulate their own styles of leadership.

NL400 Law for the Junior Officer (2-0-2). A survey of the major aspects of military justice and administrative law relevant to the junior naval officer. *Prereq: 1/C standing.*

First class midshipmen are required to complete one of the following courses which are tailored towards the major warfare specialties available upon graduation.

NS401 Junior Officer Practicum (Surface) (3-2-4). A course to provide information on the duties and responsibilities required of a junior officer in the surface community. Instruction includes advanced navigation, tactics, operational procedures and practical applications of leadership and management principles tailored to the surface force. *Prereq: 1/C standing.*

NS402 Junior Officer Practicum (Submarine) (3-2-4). A course to provide information on the duties and responsibilities required of a junior officer in the submarine community. Instruction includes advanced navigation, tactics, operational procedures, and practical applications of leadership and management principles tailored to the submarine force. *Prereq: 1/C standing.*

NS403 Junior Officer Practicum (Aviation) (3-2-4). A course to provide information on the duties and responsibilities required of a junior officer in the aviation community. Instruction includes air navigation, tactics, operational procedures and practical applications of leadership and management principles tailored to naval aviation. *Prereq: 1/C standing.*

NS404 Junior Officer Practicum (Marine Corps) (3-2-4). A course to provide information on the duties and responsibilities required of a junior officer in the Marine Corps. Instruction includes land navigation, tactics, operational procedures and practical applications of leadership and management principles tailored to the Fleet Marine Force. *Prereq: 1/C standing.*

The following courses are offered as electives.

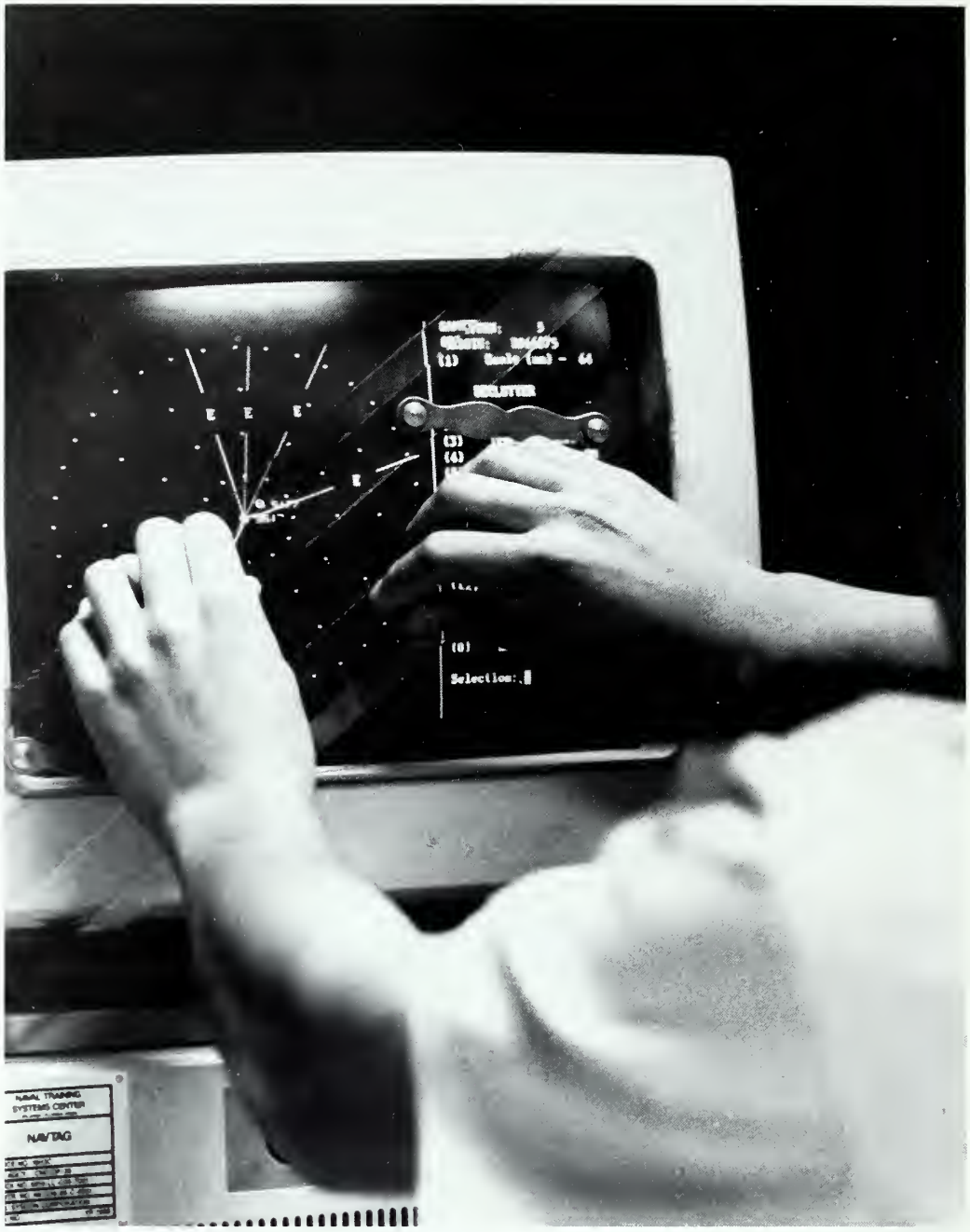
NL200 Leadership: Human Behavior (3-0-3). An introduction to general psychology, this course presents the theories and principles of individual and group behavior and their relationships to effective leadership in the naval service. *Prereq: NL102.*

NL211 Social Psychology (3-0-3). This course examines individual social behavior emphasizing the formation and effects of attitudes, interpersonal perception, conformity, group dynamics, persuasion, attraction and aggression.

NL306 Personality Theory (3-0-3). Exploration of major personality theory to provide an understanding of individual unique behavior, especially while under stress and in positions of leadership. Each midshipman will examine his or her own personality variables and construct a theory of personality. *Prereq: NL200 or 1/C or 2/C standing*

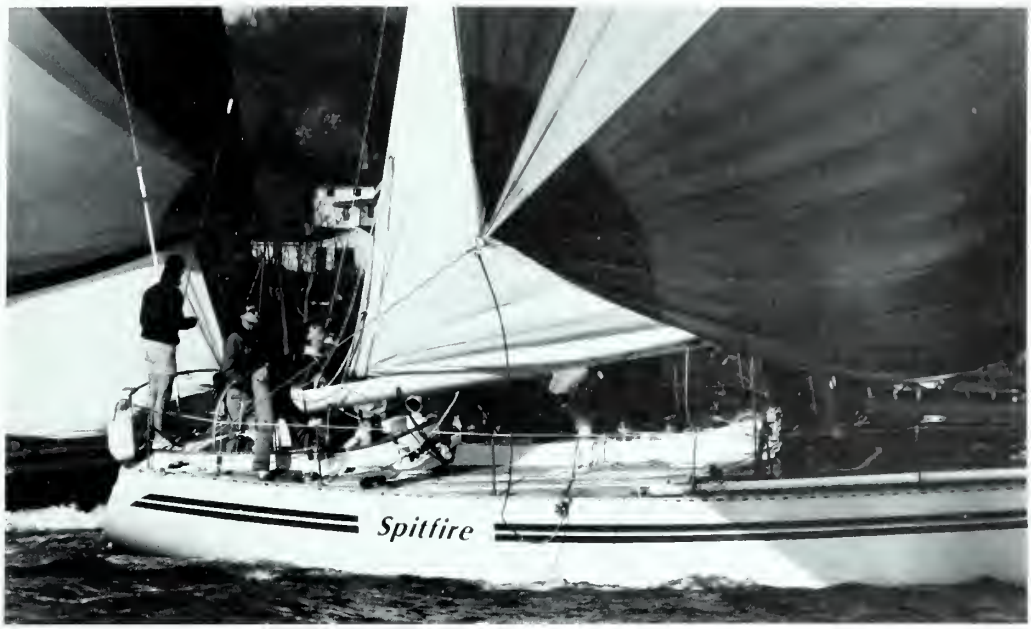
NL311 Psychology of Leadership (3-0-3). Relevance of psychological theory and research regarding leadership and motivation is emphasized to provide frameworks for understanding organizational and small-group performance. *Prereq: NL303 or concurrent enrollment.*

NL485 Leadership Seminar (3-0-3). This course serves as the capstone course in the leadership experience. Using distinguished guest instructors as well as faculty, midshipmen are exposed to writings by noted authorities in the field and to real-life situations involving military decision-making. *Prereq: 1/C standing and permission of instructor.*



Department of Professional Programs

The department of professional programs encompasses several key programs that insure midshipmen develop requisite professional knowledge as well as "hands-on" training while on summer cruises. An innovative summer training program affords first and third class midshipmen realistic experiences on a four-week fleet cruise in addition to four weeks of elective training in numerous billets at warfare schools (jump school, survivial training, etc.) summer school, research internships, sailing and open ocean yard patrol craft cruise. They also direct such key programs as the Career Information Program, Navy ship visits, Professional Competency Review (PCR) and Plebe Professional Indoctrination. These ensure that each midshipman develops a basic understanding of U.S. Navy/U.S. Marine Corps missions, tasks and capabilities so that he or she can make sound career decisions.



Department of Sailing

The department of sailing is responsible for providing all midshipmen at the Naval Academy with basic instruction in marlinspike seamanship, small boat handling and sailing. In addition, advanced training in practical seamanship, leadership, meteorology and oceanography is provided through summer elective training under sail in the Command and Seamanship Training Squadron and the offshore and intercollegiate varsity sailing teams.

Department of Technical Programs

The Department of Technical Programs is responsible for operation and maintenance of all classrooms and laboratories in support of educational programs in the Professional Development Division. Included are the Naval Academy's Planetarium, Naval Warfare Tactical Trainers, Bridge Simulators, Command Information Centers, Courseware Development Rooms, Electronic Display Classrooms and Local Area Network within Luce Hall. In addition, computer software for these systems includes digital motion video and images, windows, animation and a relational multimedia data.

Department of Seamanship and Navigation

The department of seamanship and navigation provides introductory and advanced-level courses in seamanship, navigation and tactics to prepare officers for a broad-based naval career. The department's core curriculum spans the midshipman's first three years at the Naval Academy and is designed to provide a theoretical foundation, as well as enhance practical summer training. Departmental courses are also designed to directly support first-class year specialty courses taught in the Department of Leadership and Law which are tailored to the midshipman's service selection.

Seamanship and Navigation Courses

All midshipmen, regardless of major, must complete the following courses:

NS100 Fundamentals of Naval Science (3-2-4). Introduction to the basic concepts of seamanship, engineering and shiphandling, including lab on yard patrol craft and an indoor seamanship trainer. Instruction includes operational and administrative organization, communications and rules of the road.

NS310 Strategy and Tactics (1-2-2). Midshipmen second class receive instruction in the development of modern maritime strategy as it relates to the current applications of the United States global and general maritime strategic doctrines. Instruction includes multi-ship operations, basic warfare tactics, and naval force tactical planning. The application of basic warfare tactics will be accomplished in the Naval Tactical Gaming (NAVTAG) trainer.

NN200 Navigation and Piloting (3-2-4). Terrestrial navigation including piloting, celestial and electronic navigation. Labs include practical exercises, yard patrol craft drills afloat, exercises in CIC trainers and the Naval Academy planetarium. *Prereq: NS100. (NN200 is a combination of the former courses NN203 and NN302).*

NS301 Operations and Tactics (Non-credit required course). Develops the midshipman's proficiency in advanced shiphandling, tactics and piloting during extended underway periods. Midshipmen form the nucleus of a ship's organization aboard a yard patrol craft and function in leadership and administrative roles similar to those aboard fleet units. *Prereq: NS100, NN200. (Classes of 1992 and 1993 only).*

The following courses are offered as electives:

NN412 Air Navigation Systems and Air Traffic Control (3-0-3). An advanced study and application of air navigation, including electronic, celestial and airways navigation methods and procedures. *Prereq: NN200.*

NN422 Advanced Navigation (1-2-2). The advanced study and application of surface and submarine navigation, including electronic, radar and celestial navigation, and advanced technologies. *Prereq: Grade of "A" or "B" in NN200 and NN302.*

Academy-Wide Seminars, Research Projects and Interdisciplinary Courses

Academic departments may offer seminars and individual research projects to upperclassmen on the following basis:

Seminars:

XX 481 and XX 482	1-0-1
XX 485 and XX 486	3-0-3 Advanced topics

Research projects:

A creative project in the student's field of interest. A faculty adviser must approve and monitor each project.

Prerequisite: approval of department chairman.

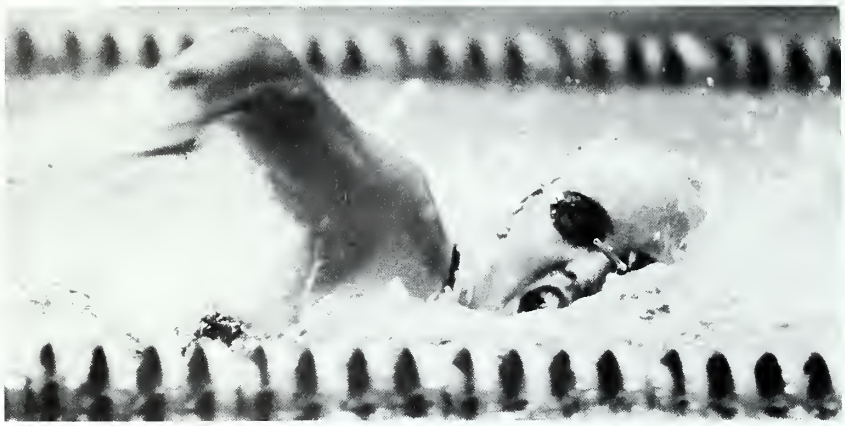
XX 491 and XX 492	0-2-1
XX 493 and XX 494	0-4-2
XX 495 and XX 496	0-6-3

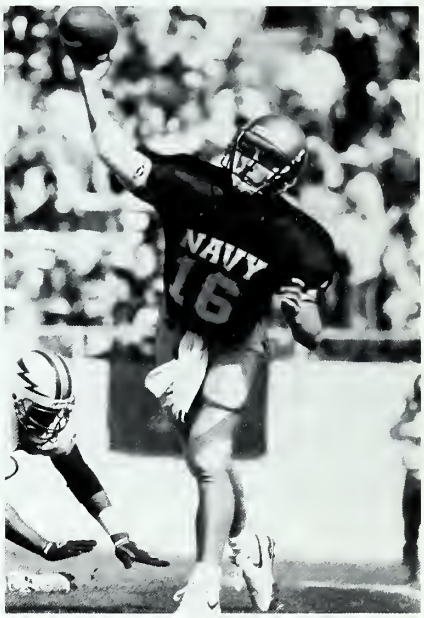
Note: XX represents the departmental designator.

Interdisciplinary courses:

Subject areas which do not fall within any single discipline or academic department. Courses are administered by the Interdisciplinary Course Committee.

ID483 and ID484	2-0-2
ID485 and ID486	3-0-3





Athletics

Just as the Naval Academy maintains a responsibility for the professional and intellectual development of midshipmen, so also must it fulfill its responsibility for each midshipman's physical development. This is met through an intercollegiate sports program that is one of the broadest in the nation -- 23 men's and 10 women's varsity teams -- and an equally ambitious intramural program. All midshipmen are required to participate in these programs, either at the varsity or intramural level.

Vice Admiral William P. Lawrence, former superintendent of the Naval Academy and an ex-POW in Vietnam once noted: "I think there is one characteristic of the American people that contributes immensely to the greatness of our country and that's our dedication to excellence in every way of American life. And I think we attach a high degree of significance to excellence in physical fitness. Intercollegiate sports more or less represents the ultimate in excellence in amateur sports -- that's one of the real values of intercollegiate athletics. It's great for the spirit and morale of the country to have this demonstration of physical excellence at the collegiate level. Intercollegiate sports impart those values a military leader must have to a large degree." Admiral Lawrence has been the recipient of two of this nation's most prestigious athletic awards -- the National Football Foundation and Hall of Fame's Gold Medal and the Theodore Roosevelt Award from the National Collegiate Athletic Association (NCAA).

The roll call of varsity "N" winners at the Naval Academy reads like a veritable Who's Who in America -- Rear Admiral Alan B. Shepard, the first

American in space and a member of the heavyweight crew; Admiral Stansfield Turner, ex-football lineman who became director of the Central Intelligence Agency; Admiral Arleigh Burke, a wrestler who later was Chief of Naval Operations; Rear Admiral Richard Byrd, the polar explorer who captained the Navy gymnastics team; Fleet Admiral Chester Nimitz, also a former Navy oarsman; and Fleet Admiral Bull Halsey of World War II fame, a football player at the academy. In recent years, the names have been Heisman Trophy winners Joe Bellino and Roger Staubach, football greats Phil McConkey and Napoleon McCallum who went on to play in the National Football League; and 1987's Collegiate Basketball Player of the Year, David Robinson.

"The two most important concepts to remember at the academy are always keep a positive mental attitude and give it all you've got!"

Robinson powered the midshipmen to the NCAA basketball tournament three straight years in the 1980s and was named the National Basketball Association "Rookie of the Year" in 1990 and will be a member of the 1992 U.S. Olympic basketball team.

A year ago, 31 Navy varsity student-athletes were accorded All-America honors, and the pistol and sailing teams won national titles. In addition, Navy won conference or regional championships in five sports.

Over the years, Navy teams have been successful in both national and international arenas. Midshipmen football teams have participated in the Rose, Sugar, Cotton, Orange, Holiday, Garden State and Liberty Bowls, and Navy's rivalry with Army is on a par with the World Series and Kentucky Derby.

Navy heavyweight crews captured the Olympic gold medal for eight-oared shells at Antwerp, Belgium, in 1920, and in Helsinki, Finland, in 1952. The heavyweight crew has won the Jim Ten Eyck Trophy (for overall team performance) at the Intercollegiate Rowing Association Championships four times in recent years, including 1990. And Navy's women's crews captured the Seitz Trophy at the Dad Vail Regatta for the fourth consecutive year in 1990.

In addition to the medal-winning crews, Navy athletes over the years have been frequent medal winners in the Olympics. Lloyd Keaser, a 1972 graduate, won a Silver Medal in wrestling in the 1976 Olympics, and David Robinson earned a Bronze medal in men's basketball at the 1988 games, one of five Naval Academy graduates competing at Seoul.

Navy's pistol team has dominated the collegiate world in recent years, winning national titles in 16 of the past 17 years. And midshipmen teams in men's basketball, men's cross country, women's cross country, men's fencing, lacrosse, rifle, soccer, women's swimming, water polo and women's volleyball have all earned berths in NCAA championship competition in the past five years.

The Naval Academy's sailing team provides midshipmen with opportunities to develop leadership and seamanship skills through competition in numerous intercollegiate and private regattas. Competition ranges from single-handed Lasers to 50-foot ocean racers with a crew of 14. The academy sponsors many of these regattas, including the McMillan Cup and the John F. Kennedy Memorial Regatta.

Jack Lengyel became the 27th director of athletics at the Naval Academy in July 1988. His first association with the academy came earlier when sons David and Peter graduated in 1980 and 1984, respectively. Lengyel held posts as athletic director at the University of Missouri and Fresno State University and coaching positions at the University of Akron, Heidelberg College, Cornell University, College of Wooster and Marshall University. A graduate of Akron, Lengyel was a letter-winner in football, lacrosse, swimming and track. He earned a master of education degree from Kent State University.

"At the Naval Academy, the athletic program is not just an extracurricular activity, it is part of the mission and as such receives a priority much different than at a civilian school. I think athletic teams are an integral part of the overall education of a total person. Athletics can provide leadership opportunities and the experiences of team play, cooperative effort, commitment and individual sacrifice for goals that some may or may not be able to achieve. Athletics are a big part of every midshipman's life at the Naval Academy.

"In our program everyone has a wide variety of athletic choices as well as the required physical education curriculum. The primary goal of the physical education curriculum is fitness, which is so vital for health, personal appearance and well-being.

"We hope to interest and insure proficiency in what we call 'carry-over' sports that our young men and women can enjoy for a lifetime, such as tennis, golf, squash, handball and swimming. Here at the Naval Academy we have excellent facilities for all midshipmen to gain the necessary skill levels for future enjoyment."

Men's varsity sports

Baseball
Basketball
Crew, heavyweight
Crew, lightweight
Cross country
Fencing
Football
150-lb. football
Golf
Gymnastics
Lacrosse
Pistol
Rifle
Sailing
Soccer
Squash
Swimming
Tennis
Track, indoor
Track, outdoor
Volleyball
Water polo
Wrestling

Women's varsity sports

Basketball
Crew
Cross country
Fencing
Gymnastics
Sailing
Swimming
Track, indoor
Track, outdoor
Volleyball

"There are all kinds of sports to play here. A person has the opportunity to get in shape and stay that way."

*"Get in shape **before** you get here."*

Intramural sports program

An equally exciting intramural sports program is organized by the Naval Academy for other midshipmen student-athletes. Competition at the intramural level is spirited and sometimes intense and allows all midshipmen to compete at a level appropriate to their individual athletic ability. Women may participate in all but football, fieldball and boxing. Company and battalion teams compete in a variety of sports including:

Basketball
Boxing
Cross country
Disc football
Fencing
Fieldball
Football
Powerlifting
Racquetball
Soccer
Softball (fast- and slow-pitch)
Swimming
Team handball
Tennis
Touch football
Track
Volleyball
Water polo

Athletic Facilities

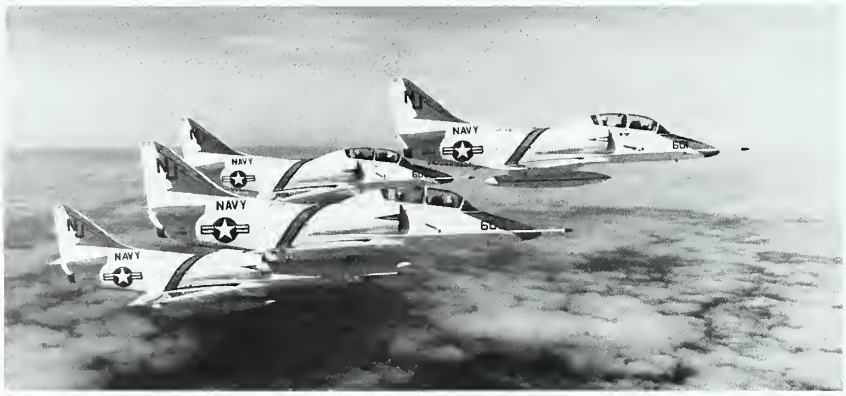
"The facilities offered here by far outrank those at any civilian school. The physical education department has outstanding facilities for any sport at any time."

In looking around the academy, you can easily determine the importance attached to athletics and physical conditioning. The facilities for intercollegiate and intramural sports, physical education and personal fitness are unsurpassed and not reserved for just a few athletes. All midshipmen have access to these facilities, for team sports or individual workouts:

- the 30,000-seat Navy-Marine Corps Memorial Stadium;
- Alumni Hall, completed in 1991 with seating of 5,710 for athletic contests and adaptable for lectures, assemblies, theatrical productions, concerts and official ceremonies.
- Lejeune Hall, built in 1982, containing an Olympic-sized pool with seating for 1,000; a diving platform and tank; 600-seat wrestling arena and personal conditioning areas;
- a 400-meter synthetic-surfaced outdoor track;
- Macdonough Hall, recently renovated, with facilities for gymnastics, boxing, volleyball, fencing, swimming, water polo, racquetball, basketball and personal conditioning;
- Halsey Field House, surfaced throughout with Tartan, including a 220-yard track, basketball courts and weight-training facilities;
- an all-weather synthetic-surfaced field for football, lacrosse and soccer;
- indoor ice rink for hockey and recreational skating;
- a 5,000-seat baseball field; and
- a challenging 6,217-yard golf course.

The athletic program is administered by the Naval Academy Athletic Association, a non-profit organization with headquarters in Ricketts Hall at the Naval Academy. The association arranges varsity schedules and provides coaching staffs and equipment.

Chapter 6



Career Opportunities After Graduation

Graduation from the Naval Academy brings new opportunities for leadership, learning, professional advancement, travel and excitement. From your very first assignment as an officer in the naval service, you will have more responsibility and challenge on the job than almost any civilian just out of college. Also, naval officers have key roles in implementing the nation's maritime strategy, a forward-based and multi-service strategy designed to deter aggression, support allies and protect U.S. interests overseas.

Your service commitment begins at graduation, when you are commissioned as an ensign in the Navy or a second lieutenant in the Marine Corps. All physically qualified graduates are commissioned into the unrestricted line of the Navy or Marine Corps. Most midshipmen who graduate but are physically ineligible to serve in the unrestricted line are commissioned in a restricted line specialty such as intelligence, supply corps or civil engineer corps.

Service Selection

The career options available to Naval Academy graduates are the broadest offered by any of the nation's service academies. You can:

- specialize in surface warfare, with assignments in ships ranging from minesweepers and hydrofoil patrol gunboats to guided missile cruisers;
- enter the submarine service, with duty in nuclear powered attack and ballistic missile submarines;
- fly a variety of aircraft from helicopters and shore-based patrol planes to supersonic, aircraft carrier-based jet fighters;
- work with nuclear propulsion systems, powerful computers and sophisticated weapons systems in locations around the world;
- command infantry, armor, artillery or aviation units as a Marine Corps officer; and
- lead the most talented and highly motivated sailors and marines in the world, no matter what career path you choose.

You choose your Navy or Marine Corps career field at the beginning of the second semester of your senior year or about four months before graduation. Midshipmen with the highest class standing have first choice, so options and choices of assignment may be affected by class rank as well as by personal and physical qualifications. However, every attempt is made to grant you the duty and location you request.

"Of all the academies the Naval Academy offers more opportunities than all the others."

"As far as career opportunities, you write the ticket."

Surface warfare

Surface warfare officers serve in every type of surface ship in the Navy. When you select surface warfare, you have the opportunity to choose the type of ship and home port of your first duty assignment. Then, after graduation from the academy, you attend a four-month Surface Warfare Officer School in Newport, R.I., or Coronado, Calif., before reporting to your ship. Your first tour of duty lasts about 30 months.

A new ensign typically serves as a division officer, with responsibilities for leading 12 to 50 enlisted personnel and directing a portion of the ship's equipment and operations. Typical positions include those of anti-submarine warfare officer, gunnery officer, communications officer and damage control assistant. In addition, you are expected to work toward qualification as combat information center watch officer, officer of the deck and Navy surface warfare officer.

Submarine force

Those choosing the silent service begin by studying Navy nuclear propulsion after graduation as described on the next page. You then go to Navy Submarine School in New London, Conn., for the 10-week submarine officers basic course. Your first tour of duty with an attack or fleet ballistic missile submarine lasts about 36 months.

In a nuclear submarine, junior officers lead divisions of 15 to 20 men. You have responsibilities in a vital area of operations such as engineering, weapons or communications. You also stand watches and work to qualify as engineering officer of the watch, diving officer and officer of the deck -- all steps towards earning the gold dolphins of a Navy submarine officer.

Nuclear propulsion

"Being only in my 20s and graduating from one of the most prestigious schools in the country with a job waiting for me provides me with much confidence and assurance of success in my future."

The Navy's demanding and highly technical nuclear power training program is among the best in the world. Those chosen for the program usually rank high in their class and have a solid background in scientific and technical courses, though not necessarily majors in these areas.

Midshipmen who choose surface warfare can join those choosing submarines in pursuing a sub-specialty in nuclear propulsion systems. If you are accepted into the nuclear power program, you report to Nuclear Power School in Orlando, Fla., for six months of schooling following graduation from the academy. You then train for six months at one of several nuclear reactor prototype sites located throughout the country before reporting to your first ship.

All of the Navy's submarines are nuclear powered. Nuclear surface ships include guided missile cruisers and aircraft carriers, and nuclear trained surface warfare officers alternate between these and conventionally powered ships as they advance in their careers.

Naval aviation

Whether it's landing an F/A-18 Hornet on the deck of an aircraft carrier, hunting a Soviet submarine in the North Atlantic in a P-3 Orion or maneuvering an SH-60F helicopter in a rescue operation, naval aviators are constantly called upon to perform under pressure. When you choose this career path, you can select training as a pilot or a naval flight officer. Pilots fly aircraft while naval flight officers serve as bombardiers, navigators, radar and electronic intercept officers and antisubmarine warfare systems specialists.

After graduation from the academy, all those choosing aviation report to Pensacola, Fla., for basic flight training. Then pilot trainees either stay in Pensacola or move on to Meridian, Miss.; Corpus Christi, Texas; or Beeville, Texas; depending on the type of aircraft they've chosen. Naval flight officers remain in Pensacola for their training. You receive your wings of gold after an 18- to 24-month training period. You are assigned to your first squadron after a six- to eight-month indoctrination tour in a fleet replacement squadron.

Besides flying, naval aviators have significant collateral responsibilities from their very first duty assignment. New officers typically are charged with leading a group of aviation enlisted personnel and overseeing an aspect of the aircraft squadron's operations, administration, personnel management or aircraft maintenance.

Marine Corps

Up to one-sixth of each graduating class may elect to be commissioned as second lieutenants in the Marine Corps. After graduation from the academy, you attend the Basic School, a 26-week course for officers at Quantico, Va. This school gives all Marine officers a common background in the tactical study of land warfare. Then you go on to advanced training in a particular occupational specialty based on your qualifications and preferences.

Marine Corps career fields include those in the two basic categories of ground and air. Ground career choices include infantry, armor, artillery, logistics, engineering, data processing and communications. Aviation choices include pilot, naval flight officer, air command and control, anti-air warfare, aviation maintenance and aviation supply.

"You will be prepared when you graduate from here. The discipline you learn here will follow you the rest of your life."

In their first assignments, Marine Corps second lieutenants generally are assigned as platoon commanders with leadership responsibilities for 20 to 25

enlisted Marines. You often have a role in a Marine air/ground task force, with Marine light infantry capable of opposing much more heavily equipped forces. Meshing of air and ground officers in these task forces and individual units gives officers the opportunity later to command combined units, not just within career specialties.

Restricted line and staff corps specialties for men

Men who are not physically qualified to serve in the unrestricted line but who can be commissioned as active duty officers can choose from a wide variety of alternatives and pursue a career all the way to the flag officer rank of admiral. Restricted line and staff corps officers make careers in the fields of intelligence, cryptology, oceanography, geophysics, medicine, engineering, supply, aviation maintenance, salvage and rescue, and public affairs. They serve aboard ships, with aircraft squadrons and at shore bases around the world. Graduating male midshipmen who are accepted to medical school may be commissioned in the Medical Corps even if physically qualified to serve in the unrestricted line.

Assignments for Women Officers

As a woman officer in the Navy and Marine Corps, many options are open to you to serve in assignments vital to our national defense. You may fly planes as a pilot or naval flight officer, or drive ships as a surface warfare officer. Following training, you would be assigned aboard a variety of Navy support ships including combat logistics ships such as oilers, tenders, training frigates and supply ships or in noncombatant aircraft. Women officers are also eligible for temporary assignments (up to six months) to any ship, including combatants, if a combat mission is not envisioned during the temporary duty period.

Many women graduates are commissioned in the general unrestricted line and choose U.S. and overseas shore duty assignments in space and electronic warfare, integrated undersea surveillance or other essential fleet support jobs. Following training, you could be assigned at naval facilities, communications sites, space support commands or major shore installations.

Women may also enter restricted line or staff corp specialties such as diving operations, oceanography, intelligence, supply, medicine or civil engineering.

You also may choose to enter the Marine Corps. Women Marine Corps officers can be assigned to all career fields available to male officers except those that could place them in combat situations. Occupational specialties open to women include supply, administration, communications, law, data processing and air control.

"In the long run, it just doesn't get any better than this!"

Career Choices of the Class of 1991

The 952 members of the Class of 1991 chose the following service and warfare specialties to enter after graduation and commissioning:

Marine Corps: 93 men, four women

General Unrestricted Line: two men, 26 women

Surface Warfare: conventional, 255 men and five women; nuclear power, 41 men

Submarine warfare: 101 men

Navy Special Warfare (SEAL): 19 men

Special Operations (diving, salvage and explosive ordnance disposal): six men and one woman

Navy Aviation: Pilot training -- 195 men and 15 women; Naval Flight Officer training -- 99 men and five women

Unrestricted/Oceanography option: four men and one woman

Unrestricted/Engineering duty option: four men and one woman

Navy Restricted Line and Staff Corps: 61 midshipmen (39 men and 22 women), including men not physically qualified for the unrestricted line duties above, elected specialization in aviation maintenance duty, cryptology, intelligence, supply corps, civil engineer corps and oceanography

Medical Corps: eight men

Interservice transfers to U.S. Air Force: six men

Typical Pay and Allowances for Junior Naval Officers

This table shows the approximate pay and allowances of Navy and Marine Corps junior officers. Promotion to Navy lieutenant (junior grade) or Marine Corps first lieutenant normally comes two to three years after commissioning. The next promotion, to Navy lieutenant or Marine Corps captain, normally comes four to five years after commissioning. All of these figures, including cost-of-living increases, are subject to change.

Monthly Pay and Allowances

	ENS/2nd LT	LTJG/1st LT	LT/CAPT
Base Pay	$ 1,504.80	$ 2,274.50	$ 2,754.30
Subsistence	$ 134.42	$ 134.42	$ 134.42
Housing Allowance**	$ 302.10 *(single)*	$ 358.80 *(single)*	452.40 *(single)*
	$ 409.80 *(family)*	$ 458.70 *(family)*	$ 537.30 *(family)*
Flight Pay*	$ 125.00	$ 150.00	$ 175.00
Submarine Pay*	$ 175.00	$ 235.00	$ 355.00
Nuclear Power Incentive*	$ 6,000 upon completion of nuclear power training		

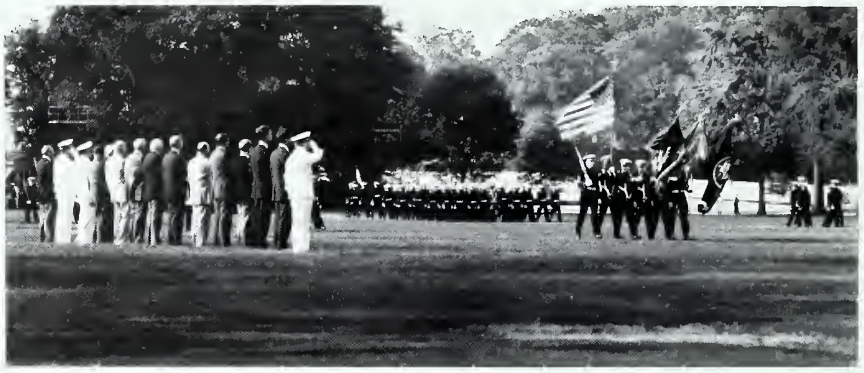
**Amounts shown are approximate and will increase with each year in service.*
*** Does not include Variable Housing Allowance, which averages $200 -300/month*

"The academy wants to produce leaders for the U.S. Navy. A lot of leadership development is forced on you, but ultimate success or failure depends on the individual. There are more opportunities than anywhere else, but a person can become a great leader anywhere. It's just easier to do here."

After Your First Tour of Duty

By the time you complete your first tour of duty, you will probably have a pretty good idea about your career goals, and the Navy and Marine Corps will give you every opportunity to achieve them. You will have assignments to prepare you for advancement and command of a surface ship, submarine, aircraft squadron, Marine Corps unit or an organization ashore.

Naval officers alternate between tours of duty with shore-based units and operational commands that deploy overseas in support of our nation's maritime strategy. You also have the opportunity for postgraduate study, advanced technical training in your specialty and coursework at military service colleges in leadership, management, tactics, strategy, politico-military affairs and international relations. You never stop learning, even as your responsibilities for people, operations and policy-making increase.



Organization

The Naval Academy is organized much like a civilian college. A board of visitors, similar to a college board of trustees, makes major policy decisions. The academy's superintendent, a Navy rear admiral, is the equivalent of a college president in that he oversees all of the school's functions.

The superintendent's principal deputies include a civilian academic dean and provost, who oversees the academic program and the faculty, and the commandant of midshipmen, a Navy captain who serves as dean of students and supervisor of all military and professional training.

The superintendent, commandant, academic dean and academic division directors sit on the academic board, which sets the academy's academic standards. The Naval Academy's 650-member faculty is composed of about equal numbers of civilian scholars and experienced military officers. The civilian professors give the academic program continuity and a foundation of scholarship and teaching experience. The officers, who rotate every two or three years, bring fresh experiences and ideas from operational and staff assignments in the Navy and Marine Corps.

Rear Admiral (Select) Michael D. Haskins, the 74th commandant of midshipmen, graduated first in the Naval Academy Class of 1966. Following studies in Argentina and flight training, he received his wings in 1968. He was assigned to Patrol Squadron Forty-Nine, then returned to the academy, where he taught History of Seapower. He earned a master's degree in international relations and international economics from the University of Oxford, England, as a CNO scholar. Haskins' duty stations include assistant plans/operations officer for Commander, Cruiser Destroyer Group Twelve; administrative officer, operations officer and safety/NATOPS officer for Patrol Squadron Forty-Five; training officer for Patrol Wing Two; and executive officer, then commanding officer of Patrol Squadron Twenty-Two. He then assumed command of Patrol Squadron One and was operations officer for Commander, Third Fleet before assuming command of Patrol Squadron Thirty-One. He was appointed deputy director of the CNO Executive Panel (OP-00K) on the staff of the Chief of Naval Operations in 1986. Subsequently, he served as Commander, Patrol Wing One and Commander, Patrol and Reconnaissance Force Seventh Fleet. In mid-1990 he reported to the National War College; he became commandant in December 1990.

"It is our mission to develop leaders, leaders of integrity, which is not a simple challenge. In its 147-year history the academy has produced not only the great leaders that fill our history books -- Nimitz, Halsey, King and Lejeune -- but also thousands of Navy and Marine Corps officers who have led, and continue to lead, our naval service in both war and peace. We shall continue this rich tradition as we shape current and future midshipmen into our leaders of the 21st century.

"It is a formidable challenge, but I cannot think of a more worthwhile job than that of commandant. The opportunity to have a positive influence on the development of these bright men and women is indeed a genuine privilege.

"The Naval Academy provided me with a first rate education; military training that has served me well these last 24 years; a commission in the Navy, which led to an exciting and adventure-filled career; and friendships and professional associations that will last a lifetime. The Naval Academy imbued me with a deeply felt sense of duty, loyalty and honor that has remained a part of every aspect of my life."

"I think that as intense an environment as the academy is, the system itself works to ensure that anyone who makes it through will have a sincere understanding of and respect for the goals and regulations of the Naval Academy."

The Board of Visitors

The duty of the academy's Board of Visitors is to inquire into the state of morale and discipline, the curriculum, instruction, physical equipment, fiscal affairs, academic methods, and other matters relating to the academy which the board decides to consider (Ex. Section 6968, Title 10, U.S. Code). The board consists of six presidential appointees, three vice presidential appointees, four appointed by the speaker of the House of Representatives, and a member designated by the Armed Services Committee from both the Senate and the House. The president of the United States receives a written report of the board's findings and recommendations.

The 1991 Board of Visitors

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Supporting Organizations

Several private, not-for-profit organizations support the Naval Academy in important ways. One of them is the Naval Academy Foundation, which awards scholarships to promising midshipmen candidates (see page 26). Others are described below.

U.S. Naval Academy Alumni Association

The Alumni Association is a non-profit, independent, self-supporting corporation of more than 32,500 members, more than half of whom are life members. All current and former midshipmen are eligible for membership and any person who has demonstrated active support of the Naval Academy or the Alumni Association may be invited to apply for Associate Membership. Benefits of membership are 10 issues each year of *Shipmate* containing news of the Naval Academy, alumni affairs, class notes and articles of interest. Members have an opportunity to purchase the annual *Register Of Alumni* and may enroll in a Group Term Life Insurance program, Group Hospitalization Plan and a Group Investment program.

Members of the Alumni Association are very active in assisting young men and women who are interested in attending the Naval Academy. Alumni chapters all over the world sponsor events for candidates and their parents, and many alumni serve as Naval Academy Information (Blue and Gold) Officers. The Alumni Association helps organize and coordinate parents clubs throughout the country and provides speakers who bring current events from the academy.

A primary mission of the association is to help the Naval Academy meet needs that cannot be met with available appropriated funds. Over the years, support has been provided in virtually every area: from academics to athletics, from books to buildings. The association is currently conducting a major campaign with a minimum goal of $24 million to provide funding for the new Alumni Hall and to create endowments in the areas of academic excellence, professional development and midshipmen extracurricular activities.

"No one can expect 17-year-olds to know exactly what they want to do with their lives, but an open mind and a strong will to face adversity are the key elements that will help you decide what is right and provide a focus for strong commitment."

Naval Academy Athletic Association

The Naval Academy Athletic Association (NAAA) promotes and finances the academy's intercollegiate athletic program, which is one of the largest athletic programs of any college or university in the United States. NAAA is responsible for the coaching, equipping, travel and lodging, promotion, ticketing and administrative support of all 33 varsity sports. NAAA also operates and maintains Navy-Marine Corps Memorial Stadium, a golf course and other athletic facilities for the academy.

As another service, NAAA operates the Naval Academy Visitors Center and Tour Guide Service. Any profits from these operations go to the Naval Academy's Memorial Fund, which supports special events and activities of the brigade. NAAA works actively with outstanding high school student-athletes who are interested in applying to the Naval Academy. NAAA coaches recruit young men and women according to the rules and regulations of the National Collegiate Athletic Association (NCAA).

Membership in NAAA is open to all Navy sports fans. NAAA's main offices are in Ricketts Hall, next to the Visitors Center.

The Naval Academy Sailing Foundation

The Naval Academy Sailing Foundation was organized in 1973 to support the academy's sailing program. Through the foundation, yachts can be donated for use in midshipmen sail training and competition. Such donations also have created an endowment that helps support the sailing program. The executive director of the foundation has an office in the Naval Academy's Robert Crown Sailing Center.

U.S. Naval Institute

"The Naval Academy is the best. If you need proof, look at a list of Annapolis grads."

In 1873 the U.S. Naval Institute was founded to advance professional, literary and scientific knowledge in the naval and maritime services. Headquartered on the grounds of the Naval Academy, the institute serves as the Naval Academy's university press, publishing texts on professional subjects, training guides and manuals, scientific and technical works and studies in naval history. The Naval Institute occasionally publishes fiction such as the recent best-sellers, *The Hunt for Red October* and *Flight of the Intruder*.

More than 100,000 members of the Naval Institute receive the monthly professional journal, *Proceedings*, and are entitled to purchase books at reduced prices. In addition, Naval Institute members receive discounts on the quarterly *Naval History* magazine, professional seminars, ship and aircraft photos, and naval art prints. The institute's main offices, bookstore and research library are located in Preble Hall and are open to the public. Annual Naval Institute membership dues are $28; students may join the Naval Institute for the half-price rate of $14.

Naval Academy Museum

Located in Preble Hall, the museum has more than 50,000 items relating to naval history from the colonial period through the era of space exploration to the launching of the *USS John Paul Jones* in October 1991. Open to the public seven days a week, exhibits include ship models, paintings, prints, uniforms, medals, weapons and evidence of the past exploits of famous naval officers in war and in peace. The museum also maintains historical items in other academy buildings, such as the crypt of John Paul Jones, ship models in virtually every building of the Yard, and many different artifacts in the Buchanan House. One of the richest resources of the Naval Academy museum is the Beverley R. Robinson Collection. Presently located in Halligan Hall, it contains more than 3,000 prints of Naval topics dating from the 1600s to the present. These prints and 16,000 other images from various collections have been captured on a 12-inch video laser disc, which is on perpetual display in the museum lobby. The overall collection is a rich resource for study and research available for examination and use by students, faculty and visiting scholars.

Appendix A: Medical Considerations

The Department of Defense Medical Examination Review Board (DODMERB) in Colorado Springs, Colo., schedules your medical examination and evaluates your medical condition very carefully before you can be offered an appointment to the Naval Academy. This is to determine whether you have a medical or physical condition that might interfere with, or be aggravated by, the academy's rigorous program or bar you from unrestricted service as an officer in the Navy or Marine Corps.

Major medical considerations are summarized here so that you and your physician and dentist can anticipate whether you meet the basic requirements for admission to the academy. This is NOT a comprehensive listing of all disqualifying conditions, but rather a brief and general guide for your convenience.

Waivers

Some medical requirements can be waived for candidates who otherwise are highly qualified. The report of your medical examination is reviewed carefully and you receive a written summary of the results. If you have a disqualifying condition but would like us to consider your application further, you may request a waiver of the standard by writing to the admissions board at the academy. If your admissions record is competitive, the board asks DODMERB to prepare your medical file for waiver consideration. DODMERB may ask you to provide amplifying information on the condition or to undergo evaluation by a medical specialist. DODMERB reviews all of the available information and may seek independent review and an advisory opinion from the staff of the Bureau of Medicine and Surgery in Washington. If your condition may be waived, and not all conditions may, your entire record is reconsidered by the admissions board. The board grants a waiver if your record suggests you have greater potential for success as a midshipman and naval officer than do competing candidates who are physically qualified.

Medical history

DODMERB will review your medical history for information on illnesses, injuries, surgery, familial diseases and other factors that could affect your physical condition. You might be asked to submit additional reports from physicians or hospitals. Correctable problems, including dental defects, should be taken care of before your examination for the Naval Academy.

Eyes and vision

This is the most common problem area for candidates. Our basic requirement for admission is normal (20/20) uncorrected visual acuity in each eye. The admissions board automatically considers waiver of the visual acuity standard for candidates who are otherwise physically qualified, who have exceptional scholastic and leadership potential, and who meet the following additional requirements:

- vision corrects to 20/20 in each eye with eyeglasses (not contact lenses);
- refractive error does not exceed 6.00 diopters in any meridian in either eye;
- astigmatism does not exceed 3.00 diopters in either eye; and

- the difference in refractive error between the two eyes does not exceed 3.50 diopters.

Again, if the *only* problem is that your *uncorrected* visual acuity is not normal, the Admissions Board will automatically consider waiver of this standard; you need not request this.

Color perception *must* be normal. Color vision is retested on Induction Day.

Do not undergo radial keratotomy if you hope to attend the Naval Academy. Radial keratotomy, keratomileusis, epikeratophakia, orthokeratology and all other surgical, laser or mechanical procedures performed to correct visual acuity are disqualifying, and waivers are not considered. Keratoconus is disqualifying.

If you wear glasses or contact lenses, take them with you to your examination. If you wear soft contact lenses, do not use them during the three days preceding your examination. Do not use hard or gas-permeable contact lenses for 21 days before your examination.

HEIGHT AND WEIGHT STANDARDS

Height (inches)	Men		Women	
	MIN	MAX*	MIN	MAX*
60	--	--	94	131
61	--	--	96	135
62	103	148	98	138
63	104	152	100	142
64	104	157	102	145
65	106	162	104	149
66	107	167	106	153
67	111	172	109	156
68	115	176	112	160
69	119	182	115	163
70	123	187	118	167
71	127	192	122	171
72	131	197	125	175
73	135	202	128	178
74	139	208	132	181
75	143	213	136	185
76	147	219	139	189
77	151	224	143	192
78	153	230	147	196

**If your weight exceeds that shown for your height, you will be asked to provide measurements from which DODMERB will estimate body fat percentage.*

Height and weight standards

The minimum qualifying height is 62 inches for men and 60 inches for women, and the maximum qualifying height for all candidates is 78 inches. Waivers may be granted by the admissions board to a limited number of exceptional candidates whose height falls either above or below these standards.

The minimum qualifying weight (by height) standards are listed in the table above. Because of substantial variation in candidates' body composition, we do not use a maximum weight (by height) standard. Instead of maximum weight, the qualifying standard is body fat percentage: no more than 26 percent for men and 36 percent for women. To facilitate processing for most candidates, however, we have adopted a table of maximum screening weights which will approximate a body fat percentage slightly less than the maximum acceptable. If your weight is at least the minimum and not more than the maximum shown for your height on the table above, we will assume that your body fat percentage is acceptable.

If your weight exceeds that shown in the table as the maximum for your height, DODMERB will ask you to provide several measurements (if these were not recorded at the time of your initial physical examination) from which your body fat percentage will be estimated. DODMERB will provide clear instructions for these simple measurements. You may ask your gym teacher (perhaps when you take your Physical Aptitude Examination), your Blue and Gold Officer, a coach, or your school nurse to take the measurements.

Obesity will not be waived, and if you exceed the body fat percentage standard on Induction Day you should expect not to be inducted.

Heart and vascular system

These conditions are disqualifying: uncorrected septal defects; congenital, rheumatic, or other abnormality of the heart valves or major vessels; abnormal heart rate or rhythm; blood pressure predominantly in the range of 160/90 or greater; severe or symptomatic varicose veins; and mitral valve prolapse which has either caused symptoms or been associated with rhythm disturbance or regurgitation.

Ears and hearing

Both ears must be free of tympanic perforation and acute and chronic disease. The average of the hearing loss at 500, 1000 and 2000 Hz in either ear may not exceed 30 decibels (ISO), and the loss at any one of these three frequencies may not exceed 35 decibels. The maximum acceptable loss in either ear at 3000 Hz is 45 decibels and at 4000 Hz, 55 decibels.

Respiratory system

Asthma, recurrent asthmatic bronchitis, exercise-induced bronchospasm or reactive airway disease by any other name is disqualifying. Nasal polyps, severe hay fever and tuberculosis (if active within two years) will also result in rejection. Nasal septal deviation, hypertrophic rhinitis and other conditions which cause significant reduction of flow through either airway or which interfere with drainage of a sinus are disqualifying; after surgical repair of a deviated septum, waiver may be possible. Allergy immunotherapy, unless established at monthly maintenance and expected to be discontinued no more than two years after matriculation, is disqualifying.

Musculoskeletal system

Ununited fractures, history of surgery to a major joint within six months, history of derangement of any major joint not corrected by surgery or evidence of instability subsequent to surgery, history of anterior cruciate ligament injury, certain retained orthopedic fixation devices, arthritis, severe scoliosis, symptomatic structural abnormalities of the spinal column, and herniated nucleus pulposis or history of surgery to the spine for this or any other condition are disqualifying.

Genitourinary system

Persistence of protein (except documented benign orthostatic proteinuria), sugar, or red or white blood cells in the urine is disqualifying, as are bedwetting continuing into adolescence and a history of recurrent or bilateral kidney stones. Severe congenital or developmental anomalies, hormonal disorders, neoplastic conditions, persistent or recurrent infections, and certain complications of infections are cause for rejection. An undescended testicle is disqualifying, as are pregnancy, endometriosis and severe dysmenorrhea.

Gastrointestinal system

History of peptic ulcer, gall bladder disease, regional enteritis (Crohn's Disease), ulcerative colitis or any other inflammatory bowel disease is disqualifying.

Neuropsychiatric disorders

Seizure disorders (except febrile convulsions in childhood), degenerative conditions, vascular or other kinds of recurrent or severe headaches and severe motion sickness susceptibility are disqualifying. History of psychosis or affective illness, personality disorder or immaturity, stammering or stuttering, eating disorders such as bulimia and anorexia, learning disabilities, and sleepwalking persisting into adolescence also are disqualifying.

Skin

Chronic diseases such as psoriasis, atopic dermatitis, and eczema are cause for rejection. Severe acne is disqualifying until successfully treated. If a course of Accutane is undertaken, this should be completed, with documentation of a favorable outcome, prior to acceptance. Pilonidal sinus, if evidenced by a discharging mass, is cause for rejection unless repaired successfully.

Other disqualifying conditions

Some other disqualifying conditions include abdominal wall hernia, until repaired; removal of the spleen for most reasons except trauma; anemia; abnormal bleeding states; diabetes mellitus; sickle cell disease (sickle cell trait and glucose-6-phosphate dehydrogenase deficiency are *not* disqualifying); any active communicable infection; generalized reaction to stinging insect venom; allergy to common foods requiring special dietary considerations; drug abuse or alcohol dependence evidenced in a urine drug test and a breath or blood alcohol test performed at the time of your physical examination; and exposure to the virus associated with AIDS (Acquired Immune Deficiency Syndrome). Testing for the presence of AIDS virus antibodies is performed in both the initial medical examination and on Induction Day at the Naval Academy. A confirmed positive result in either test leads to disqualification without possibility of a waiver.

Dental standards

Except for minor or questionable areas, you should have all required dental treatment completed before your medical examination. Missing teeth causing reduced masticatory (chewing) or incisal (biting) efficiency must be replaced by well-designed bridges or partial dentures in good condition. If you are undergoing active orthodontic treatment which will not be completed prior to your entry into the Naval Academy, you may request a waiver. Do not have braces removed prior to completion of treatment unless advised by the Naval Academy.

Other disqualifying dental conditions include:

- infections or chronic diseases of the soft tissue of the oral cavity;
- marked malocclusion that requires early or prolonged treatment, involves tissue impingement on either the facial or lingual/palatal gingiva, or in some other way jeopardizes dental health;
- unsatisfactory restorations, bridges, or dentures;
- severe or extensive apical or periodontal infection;
- perforations from the oral cavity into the nasal cavity or maxillary sinus; or
- tumors or cysts of the oral tissues that can be expected to require treatment in the foreseeable future.

Concluding comments

As you will realize from the foregoing summary, the physical examination for admission to the Naval Academy is comprehensive, and the medical and dental standards are exacting. This is necessary because our goal is for every midshipman to be able to anticipate unrestricted opportunities for commissioned service after graduation. For most candidates, the physical examination process will require no more than a single visit to a physician's and a dentist's office. For others, questions will arise that may necessitate a variety of additional evaluations. We know this can become time-consuming but we hope you will understand the reason for concern. The questions resolve favorably for the majority of candidates. Many disqualifying conditions may be potentially waived (see discussion on page 152). Staff members at DODMERB and in the admissions office will assist in every way possible.

Appendix B: Administration, Faculty and Staff

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Chief of Staff
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Deputy for Management
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B.S., U.S. Naval Academy

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M.S.A., George Washington University

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B.S., U.S. Naval Academy

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M.A., George Washington University

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B.B.A., University of Notre Dame

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B.A., Arizona State University

Assistant Director of Sports Information
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Director of Sports Promotions and Marketing
Beth B. Shumway
B.S., University of New Hampshire

Assistant Director of Sports Promotions and Marketing
Erin W. Lassen
B.A., University of Maryland

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B.S., Towson State University
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M.I.S., George Washington University
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B.A., LaSalle University
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M.S., Bowling Green State University
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M.Ed., Bowie State College
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M.A., Bowie State College
Bethany A. Carter, Lieutenant Junior Grade, USNR (Women's Swimming)
M. Ed., Springfield College
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M.S., University of Washington
Stephen M. Cooksey, Associate Professor (Men's Track)
B.S., Indiana State University
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M.S., West Virginia University
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B.A., Marshall University
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M.S., State University of New York
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M.A., Washington College
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M.A., Beaver College
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John C. Officer, Associate Professor (Tennis)
M.Ed., Boston University
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G. James Purdy, Lieutenant Commander, USN
(Facilities Manager)
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M.Ed., Pennsylvania State University
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M.S., Northern Illinois University
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B.S., U.S. Naval Academy
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B.S., University of Missouri
Reginald P. Wicks, Associate Professor (Wrestling)
M.S., Mankato State College
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B.S., U.S. Naval Academy
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(Women's Gymnastics)
M.S., University of North Carolina

Athletic Association Coaches

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Gary R. Bodie III, Intercollegiate Sailing
B.S., California Institute of Technology
George R. Chaump, Head Coach, Football
B.S., Bloomsburg University
Emmett P. Davis, Men's Basketball
M.Ed., St. Lawrence University
Charles R. Donnor, Football (Offensive Line)
M.Ed., University of Buffalo
Edward J. Donofrio, Fencing
M.A., Pepperdine
Michael A. Drake, Football (Quarterbacks)
B.S., Western Michigan University
Jake R. Gonos, Football (Linebackers)
M.Ed., Florida State University
Ronald Harris, Football (Defensive Backs)
B.A., California Lutheran
W. Frank Hickson, Football (Running Backs)
M.Ed., Wichita State University
Michael T. Hughes, Crew
M.A., Glassboro State
William C. Karditzas, Lieutenant, USNR, Pistol
B.S., U.S. Naval Academy
Kevin P. Kiesel, Football (Tight Ends, Special Teams)
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Gregory McMacklin, Football (Defensive Coordinator)
M.A., University of Arizona
Dennis Murphy, Football (Defensive Line)
M.A., University of Notre Dame
Patrick S. Owen, Golf
B.A., Johns Hopkins University
Barry L. Parkhill, Assistant Coach, Men's Basketball
B.S., University of Virginia
Michael Schwob, Men's Volleyball
B.A., George Mason University
Sam Shaffer, Football (Receivers)
B.A., Temple University
Martin Stone, Crew
B.A., St. Mary's College of California

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Credits: Cover photograph by Ken Mierzejewski *(left to right)* of Midshipman Lieutenant Commander Hunter Ware, Midshipman Lieutenant Commander Andrew Olek and Midshipman Captain Juliane Gallina. Gallina was the first female brigade commander at the U.S. Naval Academy in the Fall 1991. Other photography in this catalog is by David Eckard, Wayne McCrea and Ken Mierzejewski, all of the U.S. Naval Academy Photography Branch; former U.S. Naval Academy photographers PH1 Alexander C. Hicks Jr. and Stephanie Gross-Harvey; Phil Hoffman of the U.S. Naval Academy Athletic Association; and NASA. Inside back cover aerial photo by Sky High Studios, © 1990. Historical photographs from the U.S. Naval Academy Archives and M.E. Warren. Edited by Diane W. Olmstead and Stephanie Gross-Harvey of the U.S. Naval Academy Public Affairs Office. Published by the U.S. Naval Academy Public Affairs Office.

Calendar for Candidates Class of 1997

April 1, 1992 - February 28, 1993. Apply for admission. Refer to the steps on page 15.

1992

Spring of junior year. Write your U.S. representative and two U.S. senators requesting a nomination. Although many congressmen will accept later requests, some into the early months of your senior year, others select their nominees much earlier. Write the vice president for a nomination (very competitive) if you believe you are highly qualified for admission. Request a Precandidate Questionnaire from the Candidate Guidance Office and submit to the Naval Academy, or call 410-267-4361.

June 1. Prospective candidates commence taking scheduled medical examinations at designated medical examining centers. Each is individually notified by the Department of Defense Medical Examination Review Board (Colorado).

***June 6.** SAT test. Register by May 1.

***June 13.** ACT test. Register by May 15.

July 1 - January 31. If eligible (as explained on pages 17-19, write the Superintendent, United States Naval Academy (Attn: Nominations and Appointments Office) requesting presidential and/or other military service-connected nominations.

September 1. Beginning on this date, nominees and selected prospective nominees may expect to be contacted by a local representative of the Naval Academy Information Program.

***October 10.** SAT test (limited states). Registration September 11.

October 16. Beginning on this date, early offers of appointment are made by the Naval Academy to outstanding candidates. Offers continue into the following spring as admissions files on candidates are completed and additional well-qualified candidates are identified.

***October 24.** ACT test. Register by September 25.

November 1. Deadline for receipt by the vice president of requests for nominations. Refer to pages 18 and 20 for details.

***November 7.** SAT test. Register by October 2.

November 21. Academy Admissions Information Day.

***December 5.** SAT test. Register by October 30.

***December 12.** ACT test. Register by November 13.

1993

***January 23.** SAT test. Register by December 18.

March 21. Candidate files must be completed by this date.

May 1. With few exceptions, all candidates will be notified on or before this date whether or not they have been accepted for entry.

Early July. Class of 1997 reports to the Naval Academy and takes oath of office as midshipmen.

* See your guidance counselor for schedule confirmation and for additional information on testing and registration forms.

Note: Please request the applicable testing service(s) to forward the results of your examinations to the Naval Academy (SAT Code 5809, ACT Code 1742).

Tentative Calendar 1992-1993

1992

July 2	Thursday	Class of 1996 enters.
August 14-16		Parents' Open House, Class of 1996.
August 24	Monday	First semester begins.
September 7	Monday	Labor Day, holiday.
September 28-October 2		First marking period.
October 12	Monday	Columbus Day, holiday.
November 2-6		Second marking period.
November 11	Wednesday	Veterans' Day, holiday.
November 26-29		Thanksgiving leave period.
December 5	Saturday	Brigade at Army-Navy game.
December 9-18		Examinations.
		Christmas leave begins after last scheduled examination or military duty, whichever is later.

1993

January 6	Wednesday	Leave ends.
January 8	Friday	Second semester begins.
January 18	Monday	King's Birthday, holiday.
February 22-26		First marking period.
February 15	Monday	Presidents' Day, holiday
March 6	Saturday	Mid-term leave begins after last scheduled class or military duty, whichever is later.
March 14	Sunday	Mid-term leave ends.
March 29-2 April		Second marking period.
28 April- 7 May		Examinations.
May 7		Leave begins after last scheduled examination or military duty, whichever is later.
May 17	Monday	Leave ends.
May 21	Friday	Commissioning Week begins.
May 26	Wednesday	Graduation.
July 1	Thursday	Class of 1997 enters.

This catalog should not be considered a contract between the United States Naval Academy and any prospective candidate. The curriculum, policies and dates are subject to change to meet varying requirements of the Navy.

Traveling to Annapolis

When traveling from the north on Interstate 95 South, exit on 695 East in Baltimore, then take the Route 97 South exit. Follow Route 97 until it merges into Route 50 East.

From the south, Interstate 95 North, Route 2 North, and Route 3 North intersect Route 50. Travel east to Annapolis.

From Route 50, exit at Roscoe Rowe Boulevard. Turn left at the end of Roscoe Rowe Boulevard onto College Avenue. Turn right at King George Street, which will take you to the Main Gate of the Naval Academy.

Air

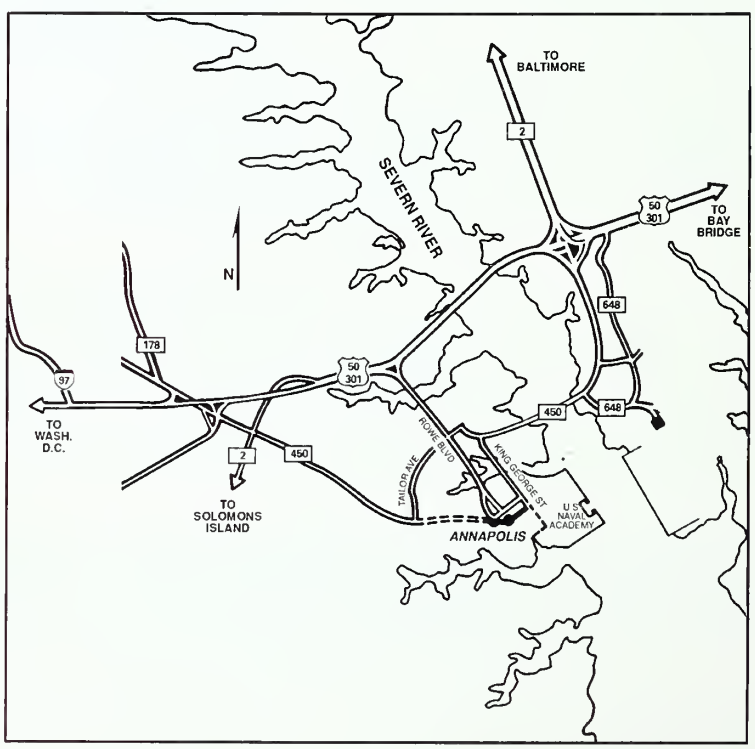
Baltimore-Washington International Airport (BWI) is convenient to Annapolis and serves most major airlines. A shuttle service runs regularly to the academy from BWI. Washington's National Airport and Virginia's Dulles International Airport are more than an hour's drive from Annapolis. Rental cars, taxicabs and limousine services are available at all three airports.

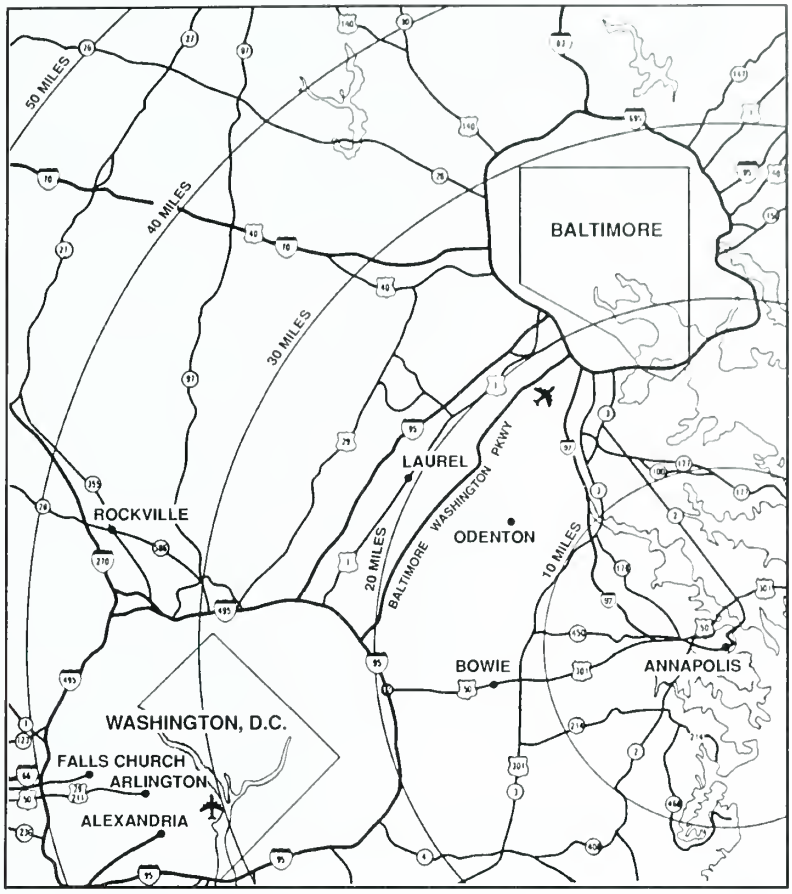
Rail

Amtrak serves Baltimore, Md., 30 miles away, New Carrollton, 17 miles away, and Washington, D.C., 33 miles from Annapolis. Taxi service is available from all rail terminals.

Bus

Greyhound/Trailways have terminals in Washington and Baltimore. Local buses run regularly from Baltimore, and Greyhound/Trailways schedule three buses daily from Washington.

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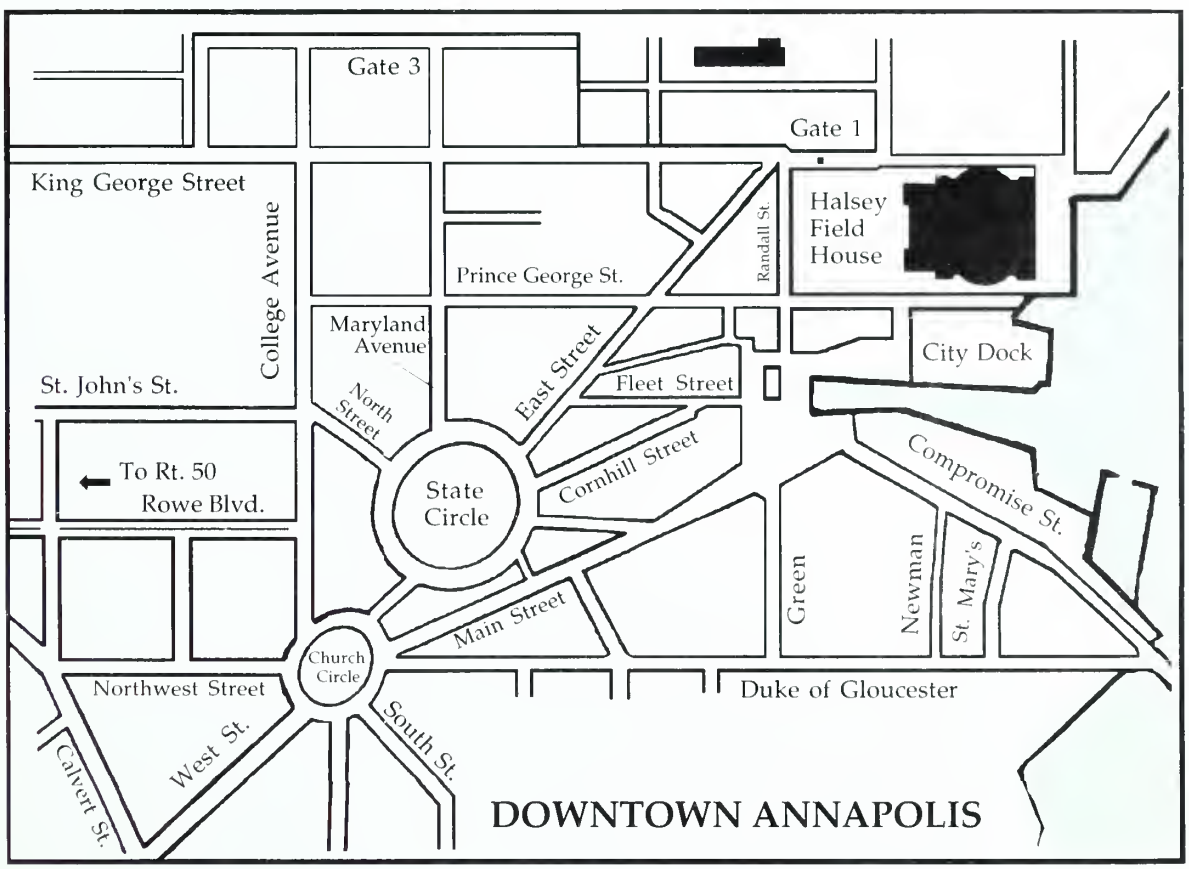
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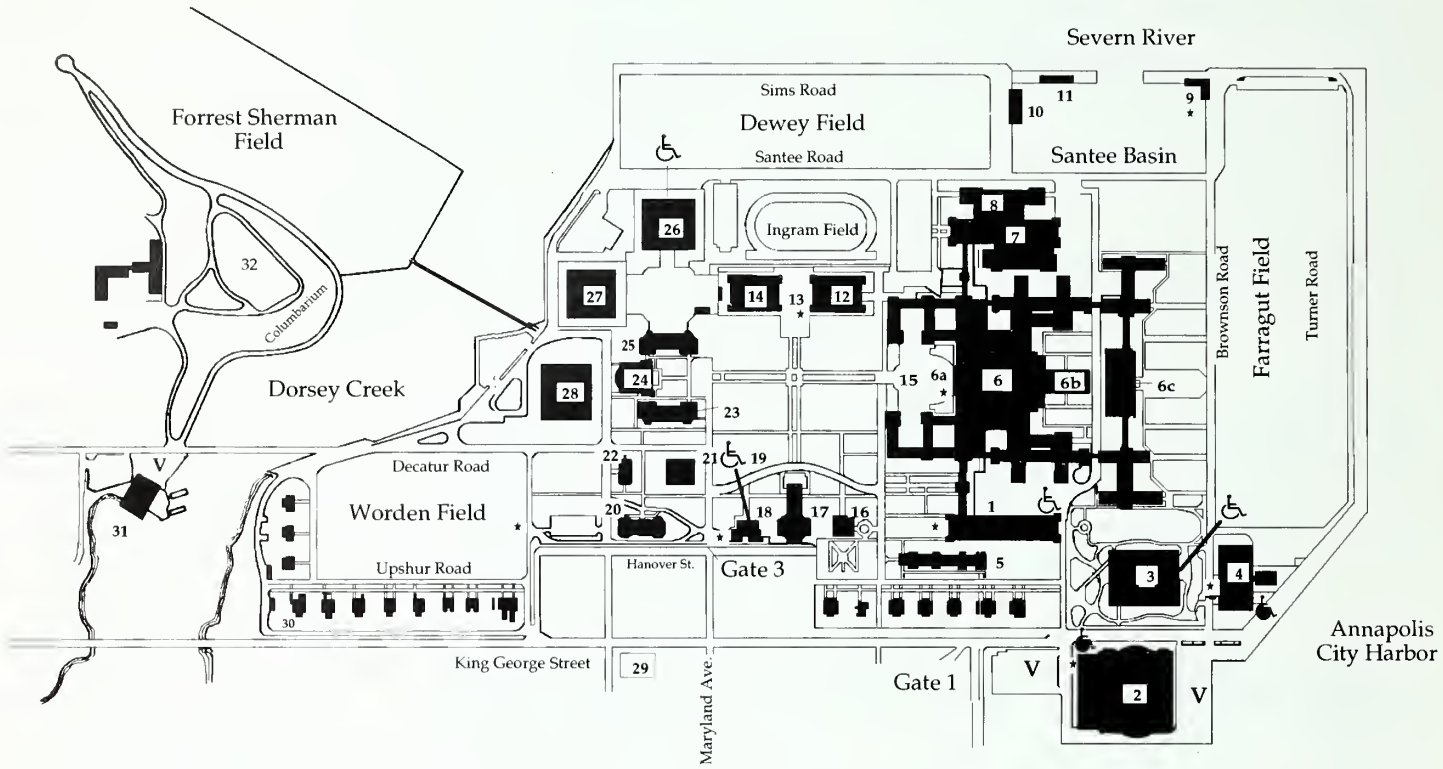

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4. RICKETTS HALL
   (Visitors' Center Senior Enlisted Barracks)
5. WARD HALL
6. BANCROFT HALL
   6a. Rotunda and Memorial Hall
   6b. King Hall
   6c. Mitscher Hall (Chaplain's Center, Inter-Faith Chapel and Auditorium)
7. MACDONOUGH HALL
8. LUCE HALL
9. ROBERT CROWN SAILING CENTER
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    (Candidate Guidance Office)
23. SAMPSON HALL
24. MAHAN HALL
25. MAURY HALL
26. RICKOVER HALL
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